The REFINER
AND NATURAL GASOLINE MANUFACTURER

SIL-O-CEL C-22 brick insulates the furnaces of the Cross units shown here. Sil-O-Cel block or Sil-O-Cel plastic cement, as required, insulate the re-action chambers, towers and large pipe-lines. The plant was designed by the C. B. Roberts Engineering Company and built by the Bethlehem Steel Company, for the Argentine Government at La Plata, Argentina.

SIL-O-CEL insulating brick are the same size and lay up in the same manner as fire brick. Special insulating mortar for use with them is included with every shipment.

For laying up fire brick where requirements are most severe we know of nothing equal to *Fraxite* high temperature cement. It sets up under the action of heat, producing a bond structurally stronger than brick itself. Shipped dry, it costs much less delivered on the job than prepared cements.

BARRIERS

STANDARDIZED INSULATION

"INSULATED CONSTRUCTION" in the specifications of many well-known makes of refinery equipment means *"Sil-O-Cel* construction."

The methods of insulating devised by Sil-O-Cel engineers, whether for furnace walls or for bare steel surfaces, almost invariably prove to be the most economical and effective ways of saving heat and controlling temperatures.

SIL-O-CEL

The materials called for in Sil-O-Cel insulating specifications—brick, block, powder, plastic cement or "insulating concrete"—each are highest in insulating efficiency of all commercial materials that withstand equal service conditions.

Just as important to the engineer and builder, however, is the assurance of uniformity which goes with every Celite product, a guarantee that Sil-O-Cel materials will measure up to the same high standards of quality whenever they are used.

CELITE PRODUCTS COMPANY

New York—11 Broadway Chicago—53 W. Jackson Blvd.
Los Angeles—1320 So. Hope St. San Francisco—140 Spear Street

Offices and Warehouses in Principal Cities

Celite Products Limited, New Birks Bldg., Montreal, Canada

Celite Products Corporation, Westminster, London, Eng.

LESS COST

BRAUN

PER B·T·U TRANSFERRED

BRAUN HEAT EXCHANGERS

C·F·BRAUN & CO·MANUFACTURING MECHANICAL ENGINEERS

ALHAMBRA, CALIFORNIA

NEW YORK·DALLAS·TULSA

Entered as second class matter June 16th, 1923 at the Postoffice at Houston, Texas, under the Act of March 3, 1879.

No Neilan device ever will fail you

That is a strong statement. Yet it is a fact. We insure that before the device is given a chance even to serve you. If we cannot accomplish any given objective with full efficiency, we will not produce a device for that purpose. Because, first of all and above all else, you must **know** that a Neilan device will never **fail.**

A Partial List of Neilan Devices

- Reducing Regulators
- Back Pressure Regulators
- Casing Head Regulators
- Vacuum Regulators
- Orifice Valves
- Gas Fuel Boiler Governors
- Balanced Lever Valves
- Float Valves
- Supersensitive Vapor Recovery System
- Steam Reducing Valves
- Pump Governors
- Liquid Level Controllers
- Gasoline and Water Separation Controllers
- Steam Traps
- Gasoline Traps
- Air Relief Valves
- Water Reducing Valves
- Altitude Valves
- Cushioned Noiseless Check Valves
- Vacuum Relief Valves

Remote Control Liquid Level Controller No. 92.

Neilan, Schumacher & Co.

641-651 Santa Fe Avenue,
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Branch Office:
626 Mayo Building, Tulsa, Okla., P. H. Wilkinson, Mgr.

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"You Can Be SURE of Neilan Products"

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3 CLARK "80's" and 2 Twins in the ~ Sig

Clark Bros. Co. OLEAN, N.Y.

125 W. First Street, Tulsa, Oklahoma
Warehouses at Tulsa, Sweetwater, McCamey, Texas, and Artesia, N. M.

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225 E. Central Ave., Los Angeles
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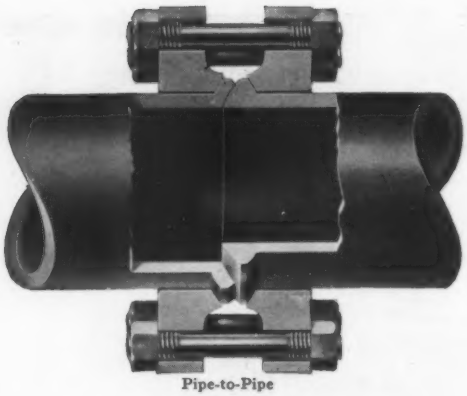
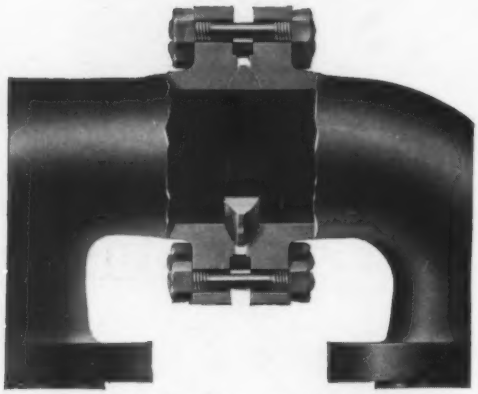
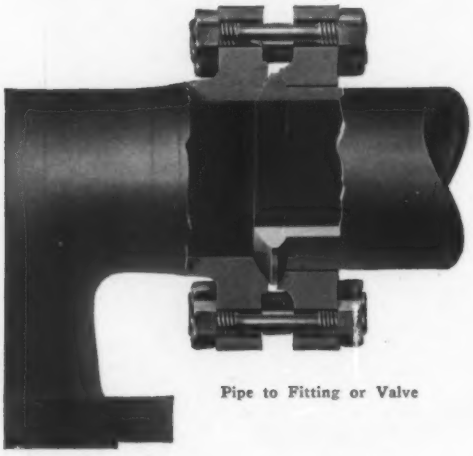


Pipe-to-Pipe



Between Valves and Fittings



Pipe to Fitting or Valve

Refiners installed more than 17,000 *during* 1926

Midwest Joints do not accidentally have such widespread use among refiners—there are very good reasons why each year a larger number of refiners standardize upon them for high temperature and high pressure service.

Midwest Joints require no gaskets—there is nothing to blow out and cause a flash and fire with its frequent expensive and disastrous consequences.

Midwest Joints make piping erection more easy and less expensive—tight joints are assured regardless of piping alignment, while correct alignment is necessary with joints of other types.

These are simply a few of the many advantages Midwest Joints have for the refiner. Circular 0-2 goes into more detail. We shall gladly send you a copy.

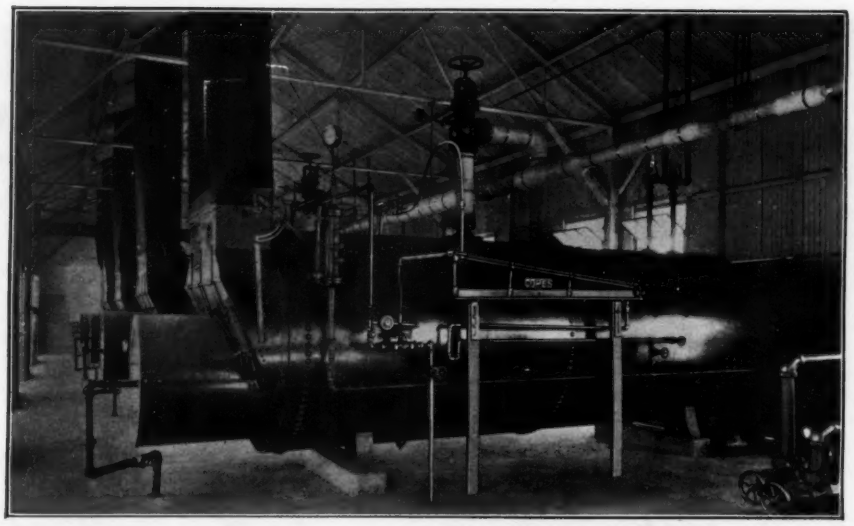
MIDWEST PIPING & SUPPLY COMPANY

Second and Miller Sts.
SAINT LOUIS, MISSOURI

Tulsa Office: 805 Mayo Building Chicago Office: 208 South La Salle St.

Fabricators of Oil Refinery, Natural Gasoline Plant and Power Piping

MIDWEST GASKETLESS JOINTS



Copes Regulators on a battery of 90 horsepower Oil Field Type Boiler in a natural gasoline plant.

Most Refineries and Gasoline Plants Use Copes Feed Water Regulators

A few Copes users in the Oil Industry

	Number of Copes in Service
Amerada Petroleum Co.	11
Associated Oil Co.	20
Atlantic Refining Co.	29
Barnsdall Refining Co.	23
Carter Oil Co.	25
Comar Oil Co.	32
Cosden & Co.	12
Empire Gasoline Co.	14
Globe Gasoline Co.	9
Gulf Refining Co.	10
Gypsy Oil Co.	7
Humble Oil & Refining Co.	14
Imperial Oil, Ltd.	51
International Petroleum Co.	17
Magnolia Refining Co.	15
Marland Refining Co.	25
Mexican Petroleum Co.	8
Mid-Continent Petroleum Co.	40
Midwest Refining Co.	17
New Orleans Refining Co.	15
Ohio Oil Co.	10
Pan American Petroleum Co.	11
Phillips Petroleum Co.	185
Producers & Refiners Corp.	9
Roxana Petroleum Co.	106
Shell Co. of California	75
Sinclair Oil & Gas Co.	44
Skelly Oil Co.	21
Standard Oil Co. of California	18
Standard Oil Co. of Indiana	10
Standard Oil Co. of Louisiana	28
Standard Oil Co. of Kentucky	6
Standard Oil Co. of New Jersey	9
Standard Oil Co. of New York	36
Standard Oil Co. of Ohio	22
Sapulpa Refining Co.	7
Texas Company	25
Tidal Refining Co.	5
Union Oil Co. of California	26
Vacuum Oil Co.	61
Virginia Gasoline & Oil Co.	30

They find that the Copes regulates the input of boiler feed water with greater safety, reliability and accuracy than is possible by hand.

Especially on oil or gas fired boilers, where the fuel supply is automatically regulated, Copes Feed Water Regulators complete the work of making the boiler plant entirely automatic. In the Copes-equipped natural gasoline plant, it is necessary for only an occasional trip to the boiler room by the man who takes care of stills and engines. The labor saving made possible by this automatic control of feed water often amounts to more than $300 a month in each gasoline plant.

The Copes is also widely used in the power plants of the big refineries. 28,000 Copes Regulators are now in service. On any size or type of boiler, they provide feed water control that is rugged, fool-proof, safe, reliable and accurate.

L. L. Baker, Chief Engineer of the Barnsdall Refining Co., has recently written an article on "Advantages of Boiler Feed Water Regulation in the Oil Industry." In it he tells of the improvement of natural gasoline plant and refinery operation through the automatic control of boiler feed water. A copy of Mr. Baker's article will be gladly sent to you for the asking. The coupon is for your convenience.

Northern Equipment Co., 620 Grove Drive, Erie, Pa.

Stock carried by B. W. Vinson, National Bank of Commerce Bldg., Tulsa.

TEAR OFF COUPON AND MAIL

Northern Equipment Co.
620 Grove Drive,
Erie, Pa.

Please send me a copy of L. L. Baker's article on "Advantages of Boiler Feed Water Regulation in the Oil Industry."

Name.....

Company.....

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COPES

SYSTEM OF BOILER FEED CONTROL

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SOUTHWESTERN

... equipment and apparatus assure uniform products in the refinery or industrial plant where close control of heating, cooling, fractionation condensation or separation is essential.

Service—Efficiency—Dependability

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Mayo Bldg., Tulsa, Okla.

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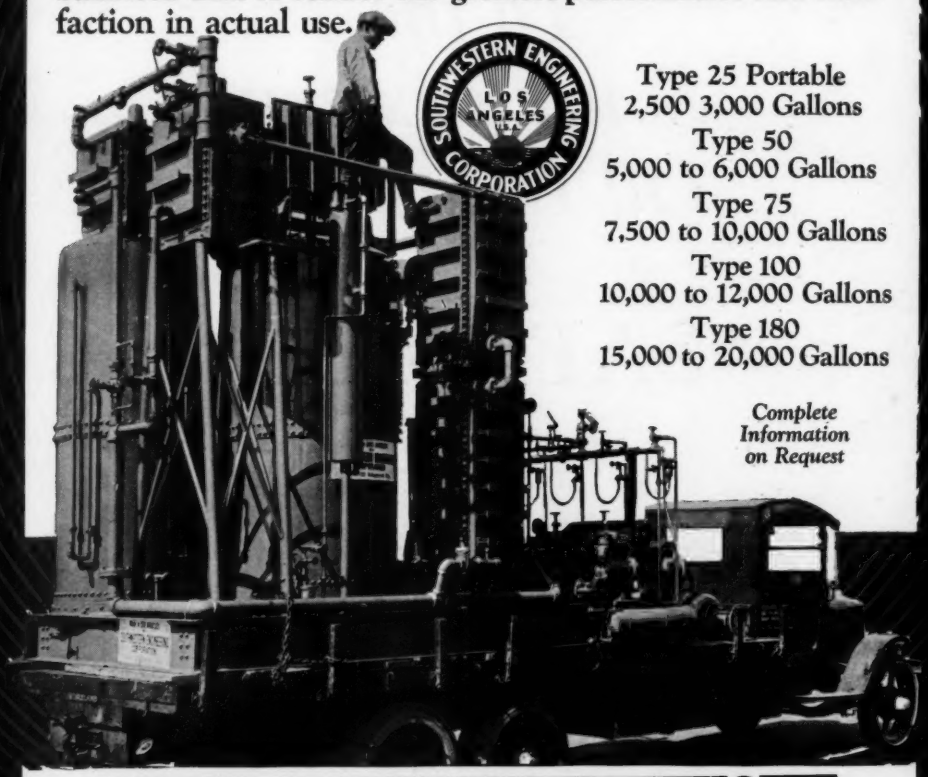
3569

The Balanced Unit
SOUTHWESTERN
FACTORY BUILT
Absorption Plants

These plants are not assembled nor sold merely upon the performance or construction of a single piece of equipment or apparatus. They are built of well proportioned and efficient component parts to insure the utmost value in a balanced unit to render the greatest performance and satisfaction in actual use.



Type 25 Portable
2,500 3,000 Gallons
Type 50
5,000 to 6,000 Gallons
Type 75
7,500 to 10,000 Gallons
Type 100
10,000 to 12,000 Gallons
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SAFEMCO
PAINTS

To the Southwestern Oil Industry—

"SAFEMCO" is your watchword for paint satisfaction

AMERICAN PAINT & SUPPLY COMPANY

DALLAS, TEXAS

Refractories Maintenance Simplified

Refineries can now keep up with and get ahead of furnace deterioration by use of new developments

IN still settings and boiler furnaces, deterioration of fire brick construction is a gradual process, which is generally permitted to continue until the entire structure requires re-building.

Efficient, economical materials and equipment, the proper use of which will compensate for brickwork deterioration as it occurs, are now available, through the development of The ADAMANT Gun and the mixtures of ADAMANT

Front wall of a Foster tube still, coated with a mixture of ADAMANT *Cement and* ADACHROME, *applied with The* ADAMANT *Gun.*

Fire Brick Cement and ADACHROME, a chemically-neutral, highly-refractory material.

When a furnace lining is originally built, it can be surfaced with a coating of the proper ADAMANT-ADACHROME mixture, blown on with The ADAMANT Gun. Providing a dense, hard and highly refractory surface, this coating is unusually resistant to the attack of the brick-destroying elements encountered in furnace operation.

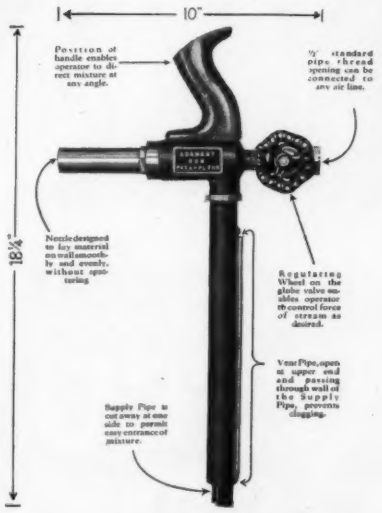
When the ADAMANT-ADACHROME surface coating thins or wears in service, and it is evident that re-surfacing is required, another ADAMANT-ADACHROME coating can be quickly applied with The ADAMANT Gun.

If the method is employed periodically when needed, joints will always be tight and firm. Brick pores, cracks and crevices will be closed. The structure's protective covering of ADA-

This side wall in a still at a large refinery has been given a protective coating of a mixture of ADAMANT *and* ADACHROME, *blown on with The* ADAMANT *Gun.*

MANT-ADACHROME is unusually resistant to the attack of fusible coal ash, sulphur or other fuel impurities which cause slagging, fluxing or melting of the brick.

The ADAMANT Gun, which applies the ADAMANT-ADACHROME mixes, is an inexpensive unit of equipment, for it costs only $25.00 in the United States, with a slightly higher price in Canada.



In marked contrast to equipment heretofore used for applying coatings to furnace brickwork, The ADAMANT Gun weighs only four pounds, and is so compact that it will fit in an average brief case.

Anyone can operate the ADAMANT Gun. No skill is necessary, for one va've on the Gun proper controls the pressure. Only one man is needed, and there are no piston-operated tanks, floats or other complicated apparatus to add to operating or maintenance difficulties.

In a number of refineries, The ADAMANT Gun and The ADAMANT-ADACHROME mixes have proved

Bridge wall in a tube still in a prominent refinery, surfaced with an ADAMANT-ADACHROME *mix, applied with The* ADAMANT Gun.

their value in prolonging furnace lining life, thereby reducing the maintenance cost of refractories. Literature and data on The ADAMANT Gun and the ADAMANT-ADACHROME mixtures are available to every interested refinery. Write for it.

Botfield Refractories Co.
783 S. Swanson St., Philadelphia, Pa.

For a Long Furnace Run, Use The ADAMANT *Gun*

ADAMANT FIRE BRICK CEMENT

Whenever You Use a Fire Brick, Use ADAMANT, *the Original High Temperature Cement*

The valves that won't leak and won't stick

Engineers recognize in Merco Nordstrom Plug Valves the correct principle of closure—the use of lubricant under pressure to maintain a tight seal at all times, permitting free turning of the plug and preventing intrusion of foreign matter to the moving parts, regardless of the kind of fluid or gas in the line. Now manufactured in sizes from ½" to 16" in every desirable type for gas and petroleum service. Catalog upon request.

MERCO NORDSTROM VALVE COMPANY

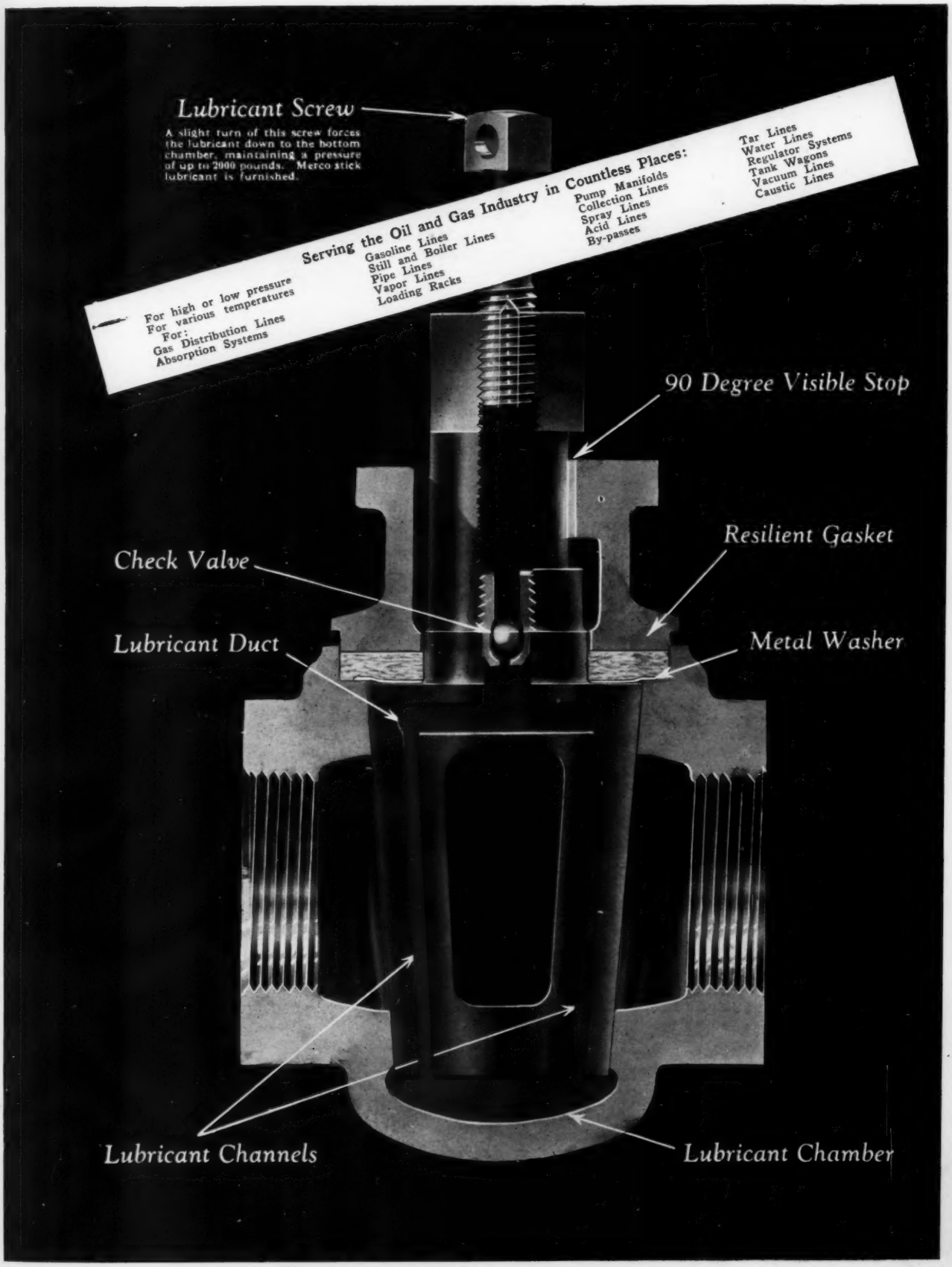
SUBSIDIARY OF THE MERRILL COMPANY

Engineers— MERCO *Manufacturers*

San Francisco 121 Second St. | Chicago Peoples Gas Bldg. | Cleveland 325 Engineers Bldg. | New York 11 W. 42nd St. | Houston 1215 Petroleum Bldg. | New Orleans 1501 Masonic Temple Bldg.

AGENCIES IN PRINCIPAL CITIES. FACTORIES AT OAKLAND, CALIF., AND BELLEVILLE, N. J.

Merco Nordstrom PLUG VALVES


Lubricant Screw
A slight turn of this screw forces the lubricant down to the bottom chamber, maintaining a pressure of up to 2000 pounds. Merco stick lubricant is furnished.
Serving the Oil and Gas Industry in Countless Places:
For high or low pressure
For various temperatures
For:
Gas Distribution Lines
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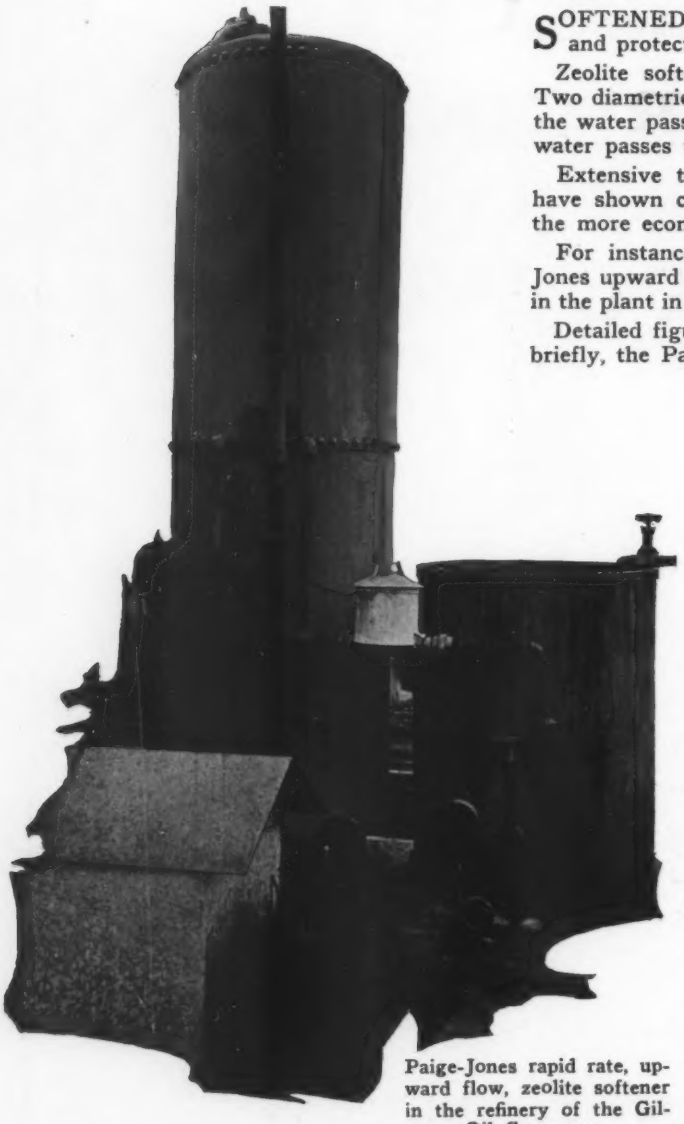
Metal Washer
Lubricant Channels
Lubricant Chamber

Softened Cooling Water At the Lowest Cost



Paige-Jones rapid rate, upward flow, zeolite softener in the refinery of the Gilmore Oil Company.

SOFTENED cooling water improves heat transfer in coils and protects engine jackets against scale formation.

Zeolite softeners are best suited for this refinery work. Two diametrically opposite systems are available—one where the water passes down through the bed; the other where the water passes upward.

Extensive tests, both laboratory and practical operating, have shown conclusively that the upward flow principle is the more economical.

For instance: a downflow zeolite softener and a Paige-Jones upward flow softener were tested on comparative runs in the plant in which they were installed side by side.

Detailed figures will be sent to any interested party—but, briefly, the Paige-Jones upward flow softener

gave 27 per cent greater capacity per regeneration

required no water for backwashing

required 3/5ths the water for regenerating

required less than ½ the time for reconditioning.

consumed considerably less salt.

Zeolite softeners are needed in refineries. The Paige-Jones upward flow softener will give the desired soft water at the lowest possible cost.

PAIGE & JONES CHEMICAL CO. *Inc.*

General Sales Office, Technical Dept. & Works: HAMMOND, IND.
Executive Offices: 461 FOURTH AVE., N. Y.
Offices in Principal Cities.

Some of the Refineries using Paige-Jones upward flow Zeolite softeners in cooling waters —part for engines and part for coils:

Empire Gasoline and Fuel Company.
Shaffer Oil & Refining Company.
Phillips Petroleum Company
Amerada Petroleum Corporation.
Gilmore Oil Company.

Paige-Jones originated and developed this type of water softener.

PAIGE & JONES WATER SOFTENINGS

ZEOLITE AND LIME SODA SOFTENERS · PRESSURE SAND FILTERS
BOILER FEED WATER TREATMENTS · HOUSEHOLD WATER SOFTENERS

BANROC PRODUCTS

The ORIGINAL and ONLY BANROC WOOL

There is only ONE Banroc Wool.

Despite attempts to imitate, and claims of "just as Good" BANROC WOOL still remains the original,—retains the same high efficiency as when first conceived by a member of this organization, over thirty years ago.

U. S. Bureau of Standards acclaims BANROC WOOL the highest efficiency of ANY heat insulation known, for temperatures up to 1200° F.

Four out of five refinery companies in this country use BANROC WOOL for insulation.

Get the facts about this remarkable heat insulation material. Send for Bulletin 24-R.

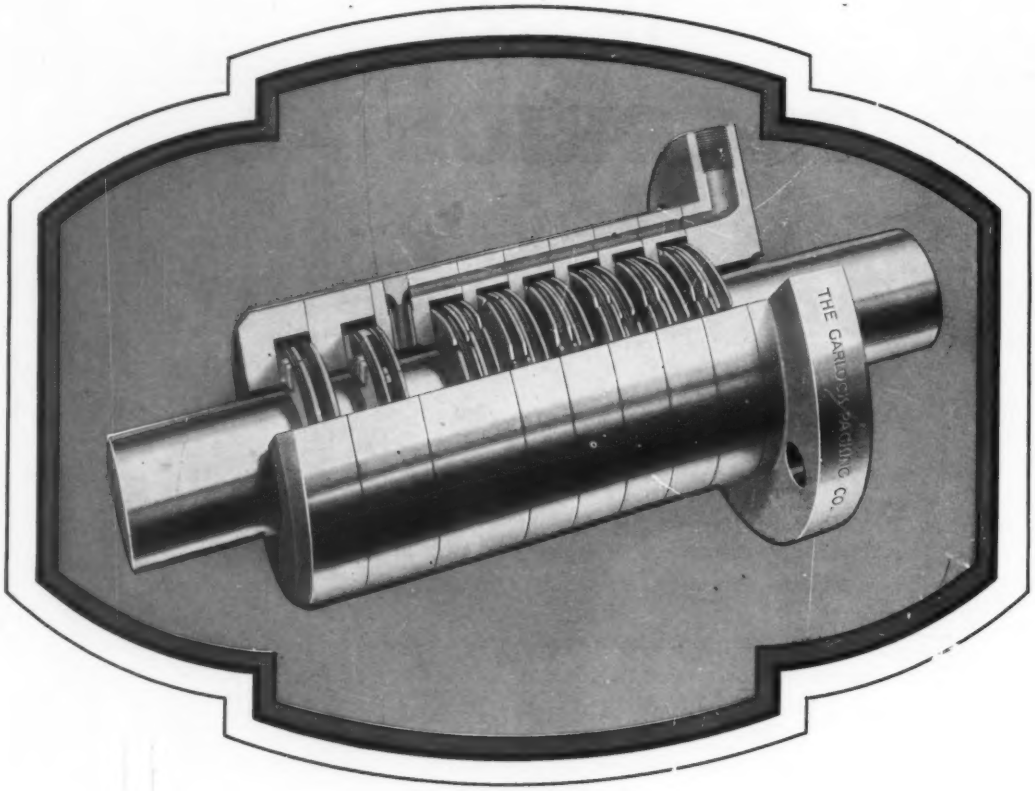
BANNER ROCK PRODUCTS CO.

ALEXANDRIA, INDIANA

Representatives in all Principal Cities

GARLOCK

GARLOCK GAS COMPRESSOR METAL PACKING THAT DOES NOT LEAK



GARLOCK - 875

For Piston Rods in Good Condition

High Pressure Service

Garlock-875 is an improved design Gas Compressor Metal Packing which, after severe service tests, has established itself as the ultimate packing for this purpose.

It reduces operating cost as it will not score or wear the rod out of round. The combination breaker-scraper rings remove the sand and grit, an abrasive element, from the piston rod and the method of lubricating allows the rod and rings to work in an oil bath.

The High Pressure Packing is an assembly of eight sections of rings, two pressure-scraper rings and six double-packing rings, enclosed in a sectional cup case as illustrated, or a split case if required. All parts of the packing are accurately machined and ground. The rings are manufactured from high carbon content interstitial cast iron and so designed that incorrect application is impossible.

The High Pressure Packing is recommended for Gas Compressor Service handling all medium and high pressures.

Low Pressure Service

Garlock-875 is also supplied to work against low pressures. It is made of the same material as the High Pressure Packing with a slight change in design. Five sections of double packing rings are enclosed in a sectional cup case, or a split case as may be specified. Where gas containing grit is encountered one of the double packing rings is eliminated and one or two breaker-scraper rings substituted.

Blue Prints and Specifications

Complete specifications and blue prints will be supplied upon application. We suggest that you write our nearest Oil Field Sales Office.

The Garlock Packing Company
Palmyra, New York

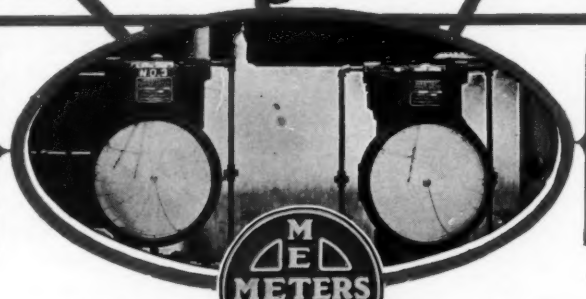
Oil Field Warehouses and Sales Offices

Houston, Texas
Pittsburgh, Penna.
Tulsa, Okla.
Denver, Colo.
Los Angeles, Calif.
Cleveland, Ohio

The Standard Packing of the World

METRIC orifice METERS

The above view shows some of the Metric Orifice Meters used by the Amerada Petroleum Corporation in their new gasoline plant at Healdton, Oklahoma. This modern plant has thus been guarded throughout against the possibility of unknown inefficiencies by the use of the most perfect instruments of measurement adapted to this service.



In this particular installation the orifice meters measure the gas and oil in connection with the absorbers. The oil meter accurately records the mineral seal oil going in; the gas meter accurately keeps track of the gas coming out. By this arrangement these meters enable the operator to keep the plant at its maximum point of efficiency.

METRIC METERS

GUESSING contributes to WASTE

What an individual **thinks** keeps **profits** off the books of many a gas and oil company.

FACTS enable ECONOMIES

What the charts of **Metric Orifice Meters prove,** convert unknown losses back to profits.

SENTINELS guard and PROTECT

Metric Orifice Meters are being used in increasing large numbers by all types of plants handling and manipulating gas, gasoline, oil, steam and water, as their value becomes better known for detecting irregularities that thieve upon economy. More constantly and dependably do they guard every operation than is possible by other mechanism or method.

YOUR PLANT may need the ORIFICE METER

In every major operation from gas and oil production to consumption, orifice meter measurement will be justified by increased operating profits. We welcome opportunities to examine blue prints of your lines and will be glad to recommend such installations as our experience has taught to be economical.

WESTCOTT & GREIS, Inc.

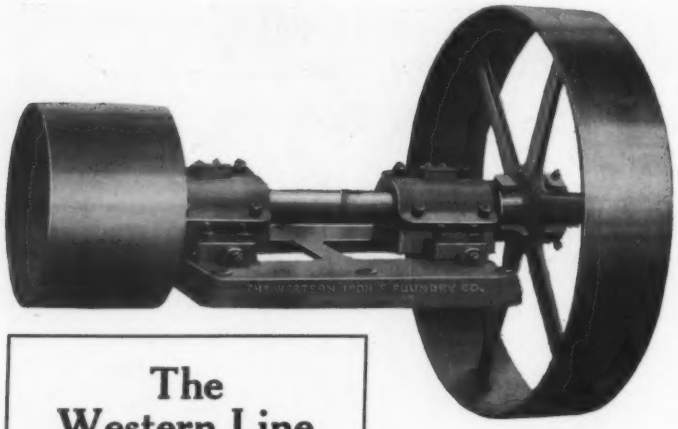
Sales Service

Dallas TULSA Los Angeles

METRIC METAL WORKS

of the American Meter Company-Inc.

ERIE - PENNSYLVANIA - U-S-A



The Western Line
Bubble Tower Castings

We are especially equipped and thoroughly experienced in the manufacture of castings for Bubble Towers.

For a quarter of a century we have specialized in steel and structural work, and we are especially equipped to manufacture and supply:

- Structural steel and iron.
- Plate and sheet work.
- Smoke stacks.
- Gray iron castings.
- Tank car repair parts.
- Dome covers.
- Outlet caps.
- Raw material from warehouse shipments.

Prompt Delivery

Because of our location in the Mid-Continent field and our experience and complete facilities, we can probably make shipments in a shorter length of time than you have enjoyed before.

Freight Rates.

Because of our central location, refiners in the Mid-Continent field will effect a saving in freight rates which is no small item.

WRITE FOR CATALOG

Special Refinery Equipment

For twenty-five years, a quarter of a century, The Western Iron & Foundry Company has been serving the Refiners. This age in itself is significant. The oldest ship that sails the sea, the oldest automobile, the oldest thing in any line is of itself of interest. It must have that about it, which makes it endure, and that ingredient in men and materials which makes them endure for lack of a better name is called quality.

Western Counter Shafts and Western River Clamps are two such products. They are made to stand the gaff; they are made for service in the oil fields where only the best endures. They withstand the severest strains and they are made of the highest grade of materials. Men who know **how** fashion their shape faultlessly.

It would be a pleasure to us to mail you special literature on our different products, and it would probably be very profitable to you. A two cent stamp will bring to your desk a descriptive folder on any of our products in which you may be interested.

The Western Iron & Foundry Company

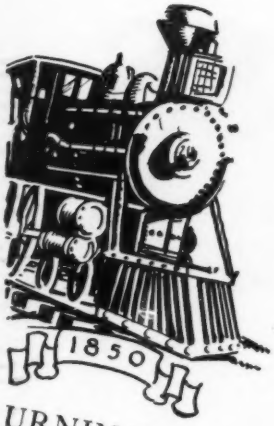
Established In 1902

WICHITA, KANSAS

Write For Catalog

OF TRANSPORTATION

THE GASOLINE MOTOR



URNING
'IVE

ing locomotive was
York State, running
August, 1831.

type shown above,
leading truck and
into general use
reight trains, and
any years.

CHANGING FEED FOR THE IRON HORSE

The development of transportation is parallel with the history of American progress.

From the old wood-burning locomotive of Civil War days to the high speed, gasoline propelled railway motor train of modern times, the pre-eminence of American transportation has been steadily maintained.

From wood to coal, to oil to gasoline, the development has been steady, until today gasoline plays its important part in the movement of railway freight and passenger traffic.

NATURAL GASOLINE plays its definite part in modern transportation, doing its share in meeting the demand for a perfect motor fuel.

CHESTNUT & SMITH
CORPORATION
Tulsa, Oklahoma

A DEPENDABLE SOURCE OF NATURAL GASOLINE

CHAR process

—Of Gasoline Recovery—

The story in a nut shell

Activated Coconut Charcoal is the *BEST ABSORBENT* for Natural Gasoline.

Charcoal plants are *MORE EFFICIENT*. That's "the story in a nutshell."

[*For the details of the story write or wire our nearest office.*]

GASOLINE RECOVERY CORPORATION
Charleston, W. Va.

TULSA
423 Wright Bldg.

LONG BEACH
Box 321

COAL

Popular in the Oil Industry for Years

Two million Laclede Fire Brick, covered in one order, were sold to one large Refiner, and the shipments to its refineries went to four different states and one foreign country.

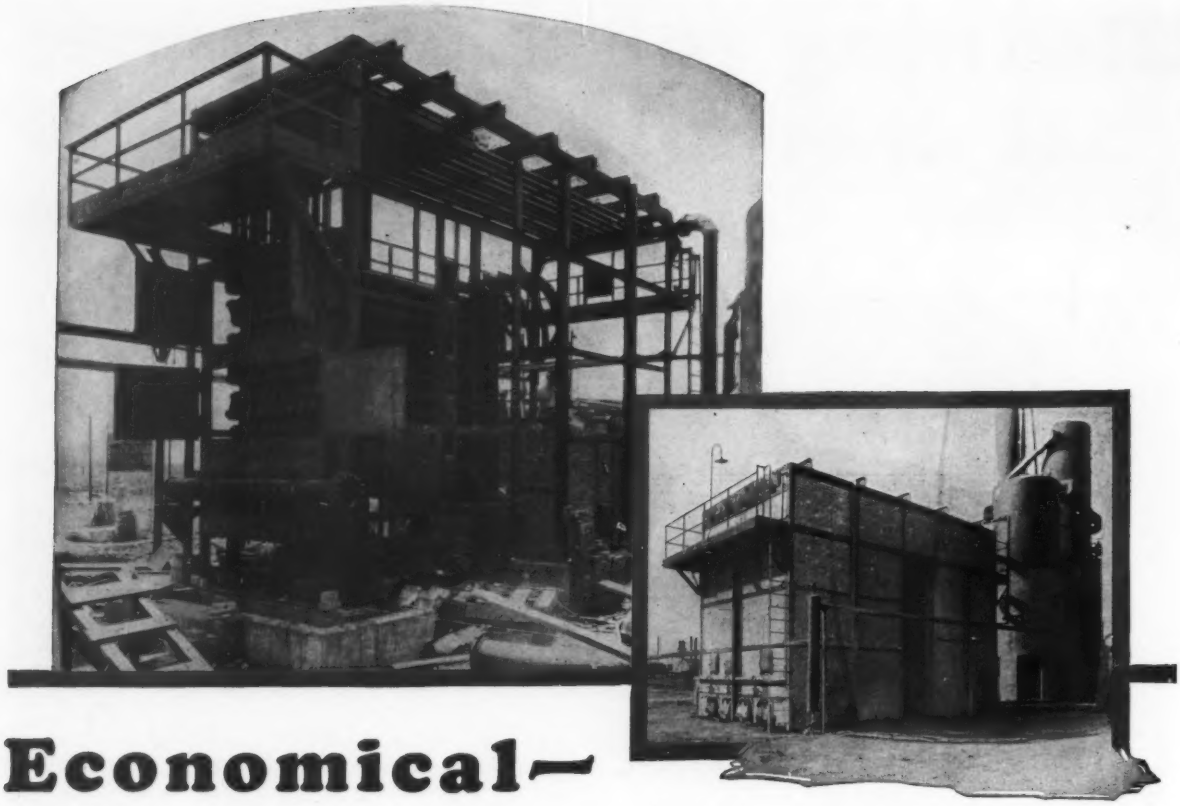
Many of the leading refiners have used Laclede Fire Brick for years. They are as pleased as our 3,000 customers in other industries, large and small, in every part of the world.

Laclede Fire Brick have been "The Standard for 83 Years." And they cost no more than ordinary fire brick. Write for a quotation.

LACLEDE-CHRISTY, St. Louis, U.S.A.

Makers of the well-known L-C Flat Arches

L10



Economical—

in fuel—space—cost

In a typical Foster Tube Still installation which replaced a shell still, it was found that the fuel consumption was reduced approximately 50%, and at the same time a greater yield of overhead was obtained. Furthermore, the positive oil circulation eliminated the necessity of using steam to prevent burning of the oil.

Besides these advantages, Foster Tube Stills are compact, economical in operating expense, permit long periods of continuous operation, and can be used for a wide range of refining distillation process.

FOSTER

POWER SPECIALTY COMPANY

Foster Superheaters, Economizers, Tube Stills, Water-Cooled Furnaces and Aero Unit Pulverizers

111 BROADWAY, NEW YORK

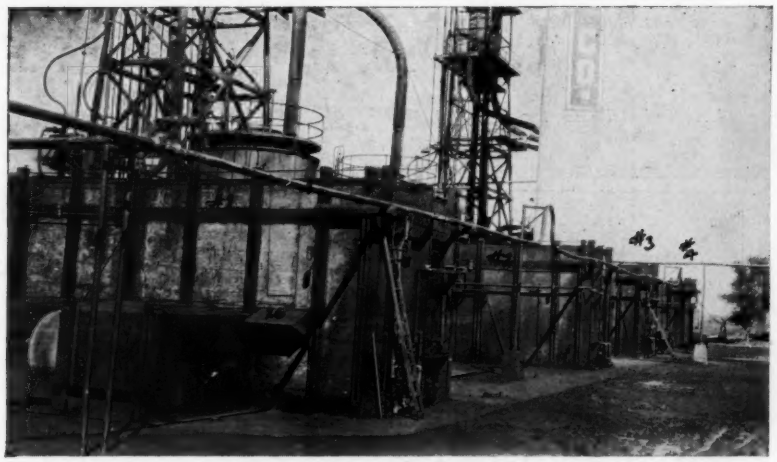
Boston	Detroit	Denver
Philadelphia	Chicago	Los Angeles
Pittsburgh	Milwaukee	San Francisco
Cleveland	Kansas City	Dallas
Atlanta	London, England	

The TUBE STILLS

with the protected surface

Mention Where You Saw the Advertisement

Cleaning tubes and pipes all around the refinery



Four Dubbs Units in the Wichita Refinery referred to below.

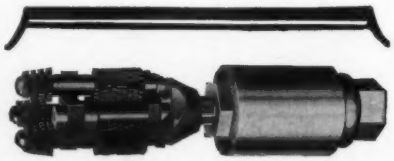
There are tubes and pipes of various sizes and shapes which accumulate a coating of scale in performing their particular duties in the different phases of the oil refining process. And there are Lagonda Cleaners which are able to remove the scale coating quickly and thoroughly—thus restoring original heat transfer rates and opening up the full area of the tube or pipe.

For instance, in one of the large Wichita refineries a corps of Lagonda Cleaners is used in different tubes and pipes as follows:

No. 80 Lagonda Cleaner for 3½" I. D. straight tubes.
No. D-153 Lagonda Cleaner for curved tubes 1.939" I. D.
No. D-193 Lagonda Cleaner for curved tubes 3.826" I. D.
No. D-344 Lagonda Cleaner for curved tubes 7 5/8" I. D.

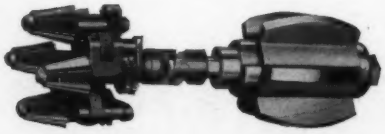
All of these cleaners are used in connection with their Dubbs Stills. In addition this refinery uses a Lagonda No. 81 Vibrator Cleaner in their return tubular boilers for removing scale from the outside of the tubes.

Whatever your needs or requirements of scale removal, there is a Lagonda Cleaner for the service.



No. 80 Cleaner with long surface cutter head.

No. D-153 Cleaner for 2-inch curved pipe as in residuum lines.



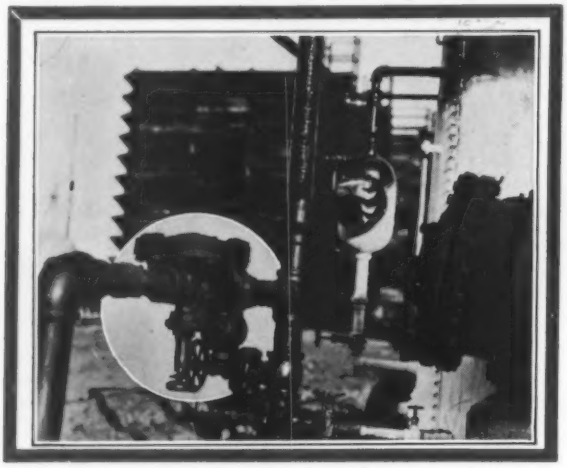
No. D-344 Cleaner as used in 7⅝-inch I. D. curved vapor lines.

The Lagonda Mfg. Co.
SPRINGFIELD, OHIO.
FUEL SAVING SPECIALISTS
NEW YORK, CHICAGO, PHILADELPHIA, BOSTON, PITTSBURGH, CLEVELAND, CINCINNATI, DETROIT, SYRACUSE, BALTIMORE, ST. LOUIS, KANSAS CITY, DENVER, DALLAS, ATLANTA, SAN FRANCISCO, MONTREAL, LONDON.

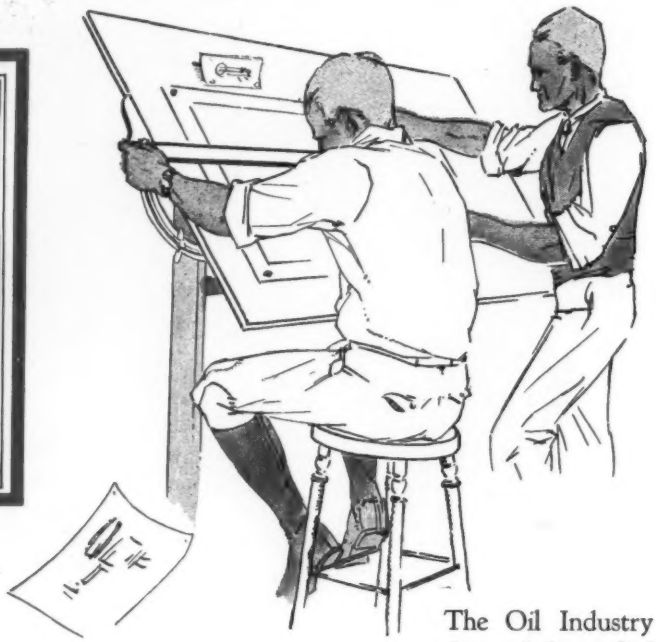
Makers of Lagonda Boiler Tube and Condenser Cleaners, Tube Cutters, Cap and Header Reseating Machines, etc. X-1424

Fisher ENGINEERING

The Fisher Type 295 Ultra-Sensitive Relief Valve is as sensitive to pressure changes as it is possible for human ingenuity to make it.
In one of the plants of the Roxana Petroleum Corporation the record of the Regulation of the pressure by this valve is almost a perfect circle, showing that its sensitivity causes it to respond immediately to the slightest change in pressure.



Above is a picture of the Fisher Type 295 Back Pressure Control Valve, operating on stabilizers in Natural Gasoline plant, Oklahoma.



The Oil Industry demanded a relief valve more sensitive than those already in use; the engineering staff of The Fisher Governor Company went to work. There was nothing very difficult about it—the problem was there, the need apparent and the result was the Fisher Ultra-Sensitive Relief Valve Type 295—a complete and satisfactory answer.

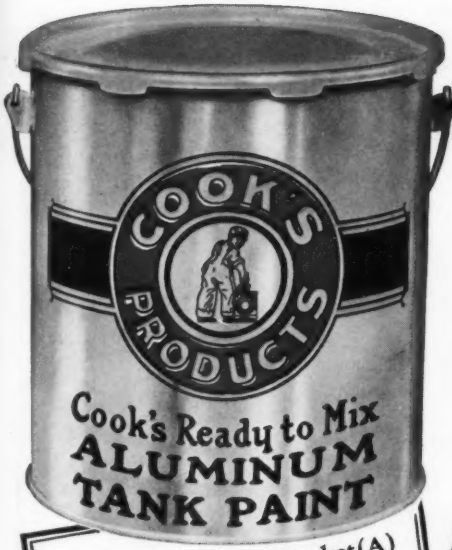
A regulating device, if it is to function properly, requires correct mechanical construction, good materials and careful workmanship—all of these are basic in Fisher Specialties. We go further than this, we comprehend the application of our experience to the interpretation of your order. If we know exactly what service a device is expected to perform, we can make it, and often times suggest means of lessening initial outlay and reducing maintenance costs.

FISHER
TRADE MARK
REGISTERED

THE FISHER GOVERNOR CO.

1313 FISHER BLDG.
Marshalltown, Iowa, U. S. A.

Mention Where You Saw the Advertisement



$2.50 per GALLON

for COOK'S READY-TO-MIX

ALUMINUM TANK PAINT

Powder in the Small Bucket (A)
Liquid in the Large Bucket (B)
Together in a 5-Gallon Package

The large bucket "B" contains the Liquid and a separate bucket "A" which contains the Aluminum Powder. Remove the lid of the large bucket and take out the smaller Bucket containing Powder. Cut out the soft tin top of Bucket "A" and dump the Powder into the Liquid. Stir well with a wide, flat paddle that is long enough to reach the bottom of the large bucket.

Mix It on the Job as You Use It—

This *fresh* mixture gives a bright, shiny paint of superior quality, containing exactly the proper proportions of Powder and Liquid. Science has taught us that Aluminum Paint must be freshly mixed to be most effective. This unique Cook package assures *easy, foolproof mixing.*

POPULAR demand and quantity production enable us to offer Cook's Ready-to-Mix Aluminum Tank Paint at this new low price.

Science has proved that Aluminum Paint, to be most effective, must be applied when freshly mixed. Because "you mix it on the job," Cook's Aluminum Tank Paint is always sure to be fresh. And because it *is* fresh, it has greater "leafing power," it wears better and reflects light and heat more effectively. The improved Cook package assures easy and foolproof mixing in exactly the right proportions—giving you bright, shiny, *new* paint, with a covering capacity of 750 square feet to the gallon. The greater leafing power of the fresh Aluminum "seals in" the paint, giving maximum wear and maximum heat reflection. One coat will do the work. It may be applied with either brush or spray.

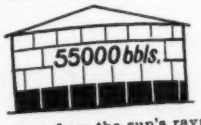
When repainting over old paint, apply Cook's Aluminum Paint direct, without a priming coat.

Unpainted tanks require a priming coat, for which we recommend Cook's Rust Inhibitive Primer, in five gallon cans at $2.25 per gallon. Covering capacity, 500 square feet to the gallon.

Send us the dimensions or capacity of your tanks with your order; and we will send you the amount of paint you will need to do the job.

Prices quoted are F. O. B. at any of our factories or branches. Absolute satisfaction guaranteed or your money back.

Fight Sunshine with Cook's Tank Paint —Save 200 Barrels Yearly, Per Tank!



Government field tests on 55,000-barrel crude oil storage tanks show that Aluminum-painted tanks lose by evaporation 200 barrels less oil in a year's time than black tanks.

Black tanks absorb the heat from the sun's rays, causing excessive evaporation. Aluminum-painted tanks *reflect* the sun's rays, and thus remain cool. It's cheaper to paint a tank than to lose 200 barrels by evaporation!

Cook Paint and Varnish Company

Pioneers in the Manufacture of Specialized Paints for the Oil Industry

Factories: Kansas City, Fort Worth, St. Louis, Houston

Branches: Chicago—Omaha—Wichita—Oklahoma City—Tulsa—Dallas
Denver—Kansas City, Kansas—St. Joseph, Missouri

NATURAL GASOLINE

A gasoline which fails to give proper results as a motor fuel is merely lacking in one or more of the vital fuel factors.

If it fails in quick starting and smooth, easy acceleration .... if it "knocks" ... if it does not come up to the highest motor fuel standards, try blending

NATURAL GASOLINE
in larger percentages

Lack of volatility is the most common fault of gasoline. Natural Gasoline is concentrated volatility, and when added to gasoline produces a motor fuel that will satisfy motoring requirements.

Many interesting facts regarding Natural Gasoline have been developed from the program of research conducted by this Association. The bulletins will be sent free upon application to Research Department, Association of Natural Gasoline Manufacturers, Cosden Bldg., Tulsa, Okla.

ASSOCIATION OF NATURAL GASOLINE MANUFACTURERS

RESEARCH DEPARTMENT ASSOCIATION OF NATURAL GASOLINE MANUFACTURERS

SUNOCO

Owing to the increased demand for—

Sunoco Absorption Oils 630 *and* 670

We have just completed the erection of a new plant at Yale, Oklahoma

The demand for these two oils has made necessary greater plant facilities. We appreciate this manifestation for a superior product and will do everything to supply the demand.

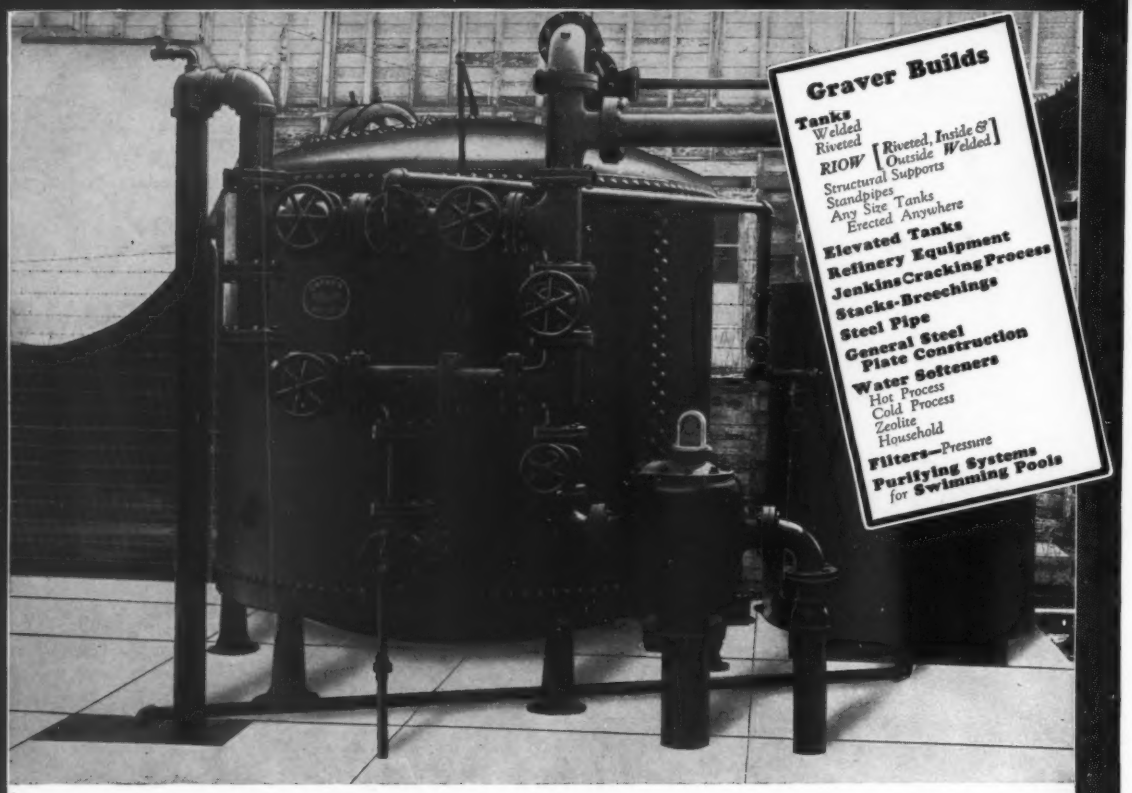
While attending the convention of the Association of Natural Gasoline Manufacturers, May 24, 25 and 26, why not drop into our Tulsa office and let us show you samples and explain the merits of these two oils. You are cordially welcome.

SUN COMPANY

Petroleum Bldg., Tulsa, Oklahoma

Refineries at

Marcus Hook, Pa. **Yale, Oklahoma** **Toledo, Ohio**



Natural Gasoline Plants

You don't have the opportunity to choose your water supply at a gasoline plant. You take it "as is." And generally "as is" means "hard water"—"muddy water"—"limited water."

If this is the case, and it generally is, you can rest assured that a water softener will be the best paying investment you ever made. You know what hard water will do to your cooling coils by depositing scale, making adequate cooling a problem, in your oil engines its the same trouble coating the cylinder with scale and preventing adequate cooling, and in the boilers it coats the tubes and walls preventing the ready absorption of heat.

All this trouble can be eliminated and is being eliminated continually by Graver Water Softeners. There are many installations within easy reach for inspection—anywhere in the oil country.

In planning a new plant or in any operating plants let us get a sample of water and analyze it. It won't obligate you and will show you what water softening can save you.

GRAVER Corporation Founded 1857
EAST CHICAGO, INDIANA

NEW YORK Grand Cent. Term. | CHICAGO Steger Building | TULSA Atlas Life Bldg. | HOUSTON West Building

—for Forged Steel Valves?

No. 866—600 lb. Flanged End, Flanged Bonnet, O. S. & Y. Globe Valve

Why EDWARD of course!

For fourteen years **Edward forged steel** valves have been marketed as a standardized product.

Even as pioneers, Edward fostered the principle of general use of **forged steel** small valves in preference to valves of cast materials.

This theory is now finding great favor as indicated by the wholesale selection and very definite preference for **forged steel** in the moderate classes of service as well as the more severe.

Edward continued leadership is evidenced by its variety of advanced designs.

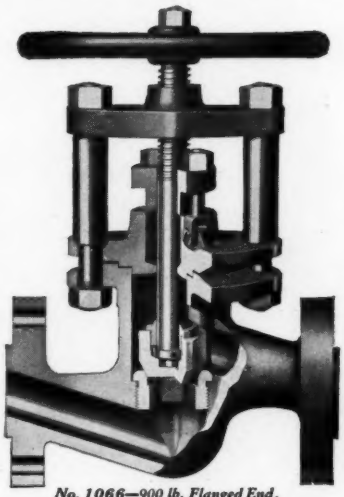
Therefore—if it is **forged steel valves** you want—put your requirements up to Edward.

Complete data and prices sent upon request.

The Edward Valve & Manufacturing Co.

East Chicago, Indiana

Representatives in all principal cities.

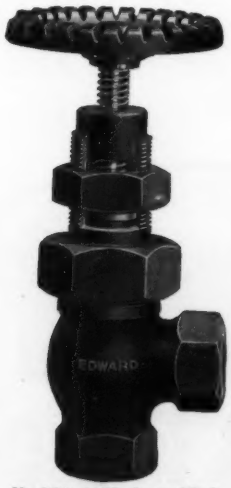


No. 1066—900 lb. Flanged End, Flanged Bonnet, Globe Valve

No. 876—600 lb. Flanged End, Union Bonnet, O. S. & Y. Globe Valve

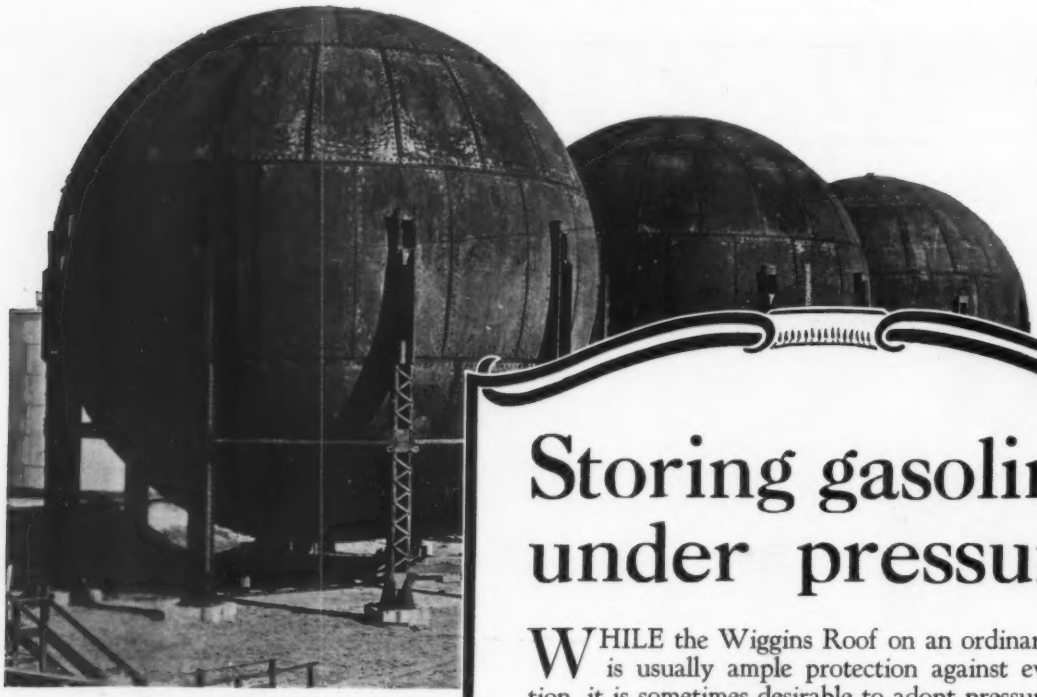
No. 876G—600 lb. Flanged End, Flanged Bonnet, O. S. & Y. Globe Valve

No. 682—500 lb. Screwed End, Union Bonnet Globe Valve



No. 681—500 lb. Screwed End, Union Bonnet Angle Valve

No. 680G—500 lb. Screwed End, Flanged Bonnet, O. S. & Y. Globe Valve



Three 48 ft. Hortonspheres in service at a southern refinery for the storage of gasoline.

Storing gasoline under pressure

WHILE the Wiggins Roof on an ordinary tank is usually ample protection against evaporation, it is sometimes desirable to adopt pressure storage for the very lightest fraction from oil and for gasoline produced from natural gas.

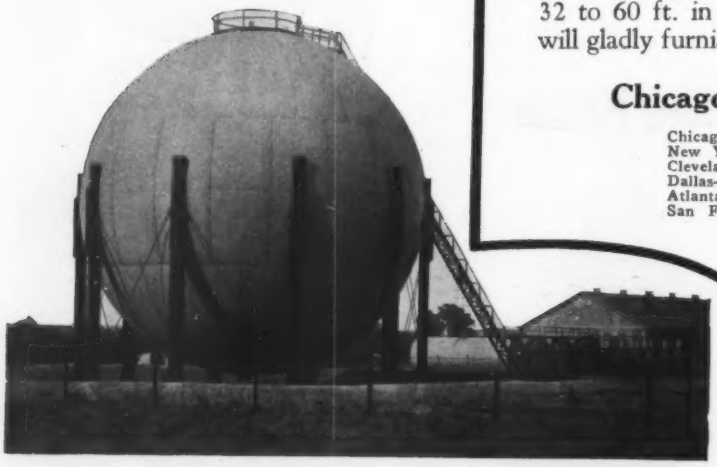
In such cases the Horstonsphere offers the ideal storage unit. It has a low first cost because it is complete in itself. No additional equipment is required. And it has no operating cost.

Many refiners and natural gasoline manufacturers have demonstrated the profit to be made by storing their off-season output in Hortonspheres and selling on the high price level. Some are also using Hortonspheres for storing ammonia and gas.

These storage units are made in standard sizes from 32 to 60 ft. in diameter. Our nearest sales office will gladly furnish information and quotations.

Chicago Bridge & Iron Works

Chicago—2463 Old Colony Bldg.
New York—3102 Hudson Terminal Bldg.
Cleveland—2234 Union Trust Bldg.
Dallas—1655 Dallas National Bank Bldg.
Atlanta—1046 Healey Bldg.
San Francisco—1051 Rialto Bldg.



The Hortonsphere shown at the left stores natural gasoline at an Oklahoma plant.

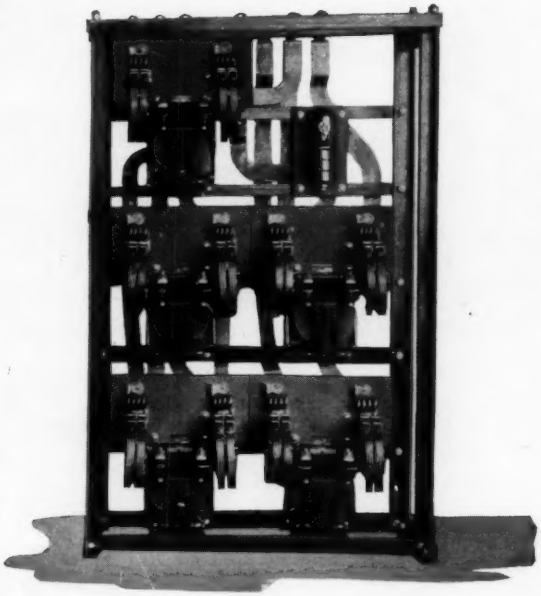
THE HORTONSPHERE

for Pressure Storage

R&NGM5-Gray

Mention Where You Saw the Advertisement

Oil-Immersed Controllers



This is an EC&M push-button operated controller for a slip-ring motor. It is totally oil-immersed.

EC&M makes a complete line of oil-immersed controllers and starters for all types of motors; slip-ring, squirrel cage and synchronous. Oil-immersed automatic transfer switches are available, to throw over automatically an emergency power supply if the regular supply fails.

The oil industry has recognized the merits of EC&M oil-immersed control equipment. Many of the oil companies have standardized on EC&M equipment throughout.

THE ELECTRIC CONTROLLER & MFG. CO.

CLEVELAND, OHIO

BIRMINGHAM-BROWN-MARX BLDG.
CHICAGO-CONWAY BLDG.
CINCINNATI-1ST NATIONAL BANK BLDG.
DETROIT-DIME BANK BLDG.
NEW YORK-50 CHURCH ST.
LOS ANGELES-AMERICAN BANK BLDG.
SALT LAKE CITY-228 W. SO. TEMPLE
PHILADELPHIA-WITHERSPOON BLDG.
PITTSBURGH-OLIVER BLDG.
SAN FRANCISCO-CALL BUILDING
SEATTLE-570 COLMAN BLDG.
TORONTO-METROPOLITAN BLDG.

Refractory Efficiency

—at lower cost!

Athens Brick & Tile Co.,
Athens, Texas

Elgin Butler Brick Co.,
Austin, Texas

Texas Clay Products Co.,
Malakoff, Texas

Acme Brick Co.,
Ft. Worth, Texas

LONG of refractory efficiency, short on freight expense! That's the sum total of the benefits the Southwestern Refiner derives through the use of this locally manufactured product—

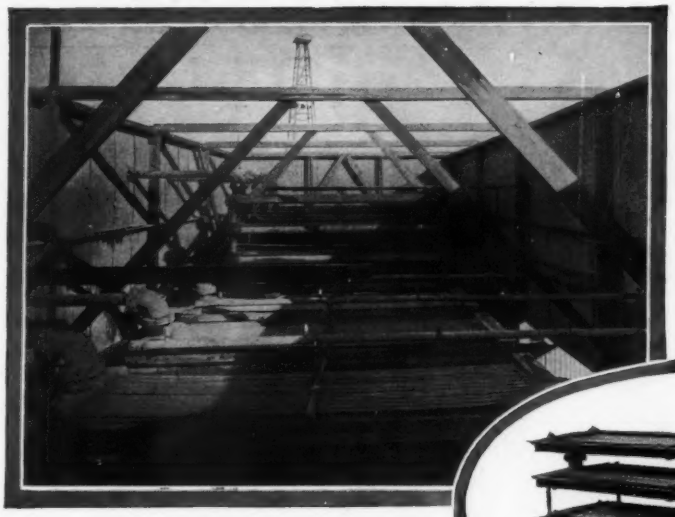
TEXAS Fire Brick

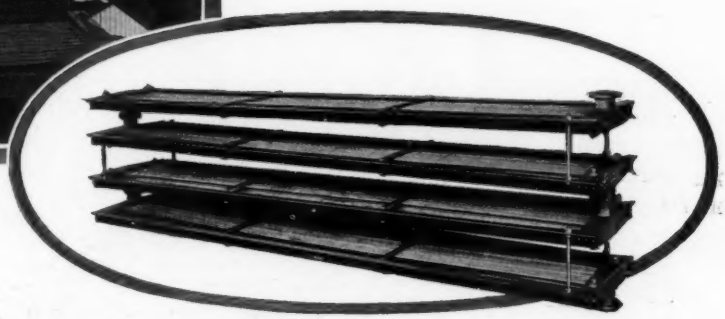
A Quality serving more than 85% of fire brick uses. You get brick of precisely the refractory efficiency you require. And the short freight haul cuts the cost.

Write any Association Member for Figures on Your Requirements

Texas Fire Brick Manufacturing Ass'n

PROMOTING TEXAS FIRE BRICK ECONOMIES





The G-R Bentube Section

AN atmospheric cooler that automatically cracks off the scale formed on the outside of the tubes by the pronounced bowing of the tubes on change in temperature whenever steam or vapor is admitted to the section.

This scale-shedding action keeps the scale from building up to a thickness that will reduce the heat transfer rates below those for which the cooler is designed.

These sections are standard and interchangeable, provide for expansion, drainage and easy cleaning, are easily moved to new locations, and can be added to as desired for increase in capacity or greater cooling effect.

The many advantages of the G-R Bentube Section—its exclusive scale-shedding feature, interchangeability, long life, flexible capacity and high salvage value, make it well worth your further investigation.

Send for bulletin

THE GRISCOM-RUSSELL COMPANY
285 Madison Avenue

Philadephia	Chicago	St. Louis	San Francisco
Boston	Detroit	New Orleans	Los Angeles
Rochester	Cleveland	Dallas	Seattle
Pittsburgh	Milwaukee	Houston	Salt Lake City
Columbus	Minneapolis	Atlanta	Tulsa
Indianapolis	Kansas City	Charlotte	Denver

For Canada: Riley Engineering and Supply Co., Ltd., Toronto

Griscom-Russell

Heat Transfer Apparatus

HEAT EXCHANGERS
CONDENSERS
Sub-cooling—Partial—Reflux
Shell-and-Tube, Atmospheric, and Condenser Box Types
COOLERS
Liquid—Gas—Jacket Water
Shell-and-Tube, Atmospheric, and Condenser Box Types
OIL HEATERS
LEVEL CONTROLLERS

What Word Recurs Most Often in This Ad?

Glance over these comments from Kerr Turbine users. One word is used more often than all the others. It must be the most natural word to describe Kerr Turbine performance.

Our salesman will be glad to show you photostat copies of these comments in full.

"Kerr Turbines in service here for several years have proven VERY SATISFACTORY-"

"Our Kerr Turbines have proven VERY SATISFACTORY. Good service and low maintenance cost."

"WE RECOMMEND KERR TURBINES VERY HIGHLY and would duplicate our present plant were we in the market."

"I CANNOT SPEAK TOO HIGHLY of the performance and efficiency of Kerr Turbines in our case. Service rendered more than could be expected."

"I have installed three Kerr Turbines in the last seven years; these machines have all proven VERY SATISFACTORY."

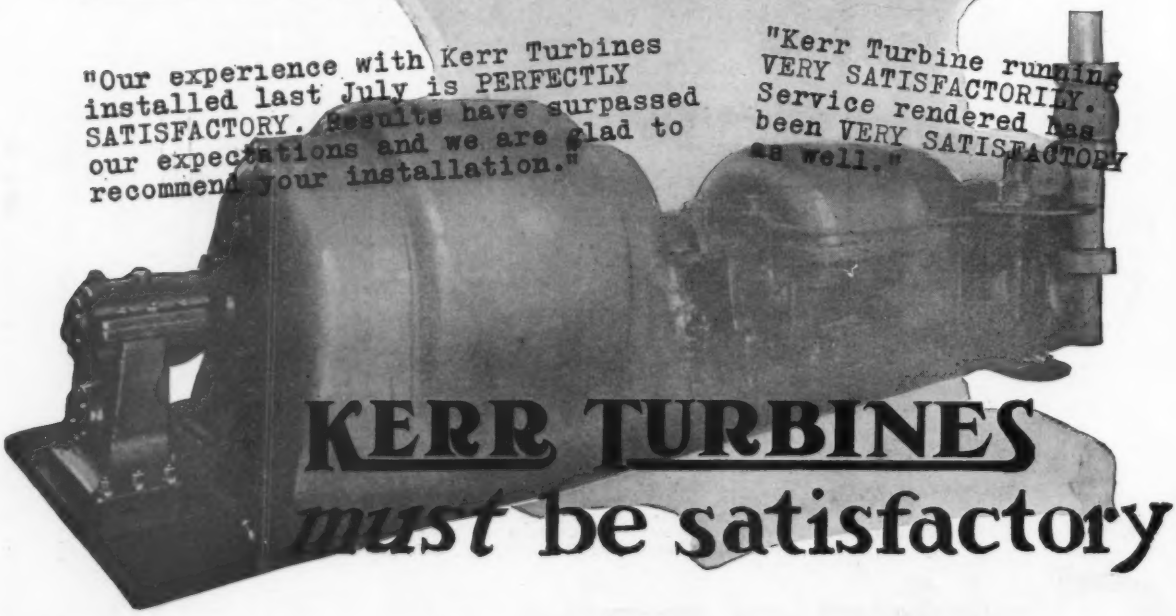
"Our 2250-kw. Kerr Turbine is PERFORMING FIRST CLASS and consider same rugged, economical unit."

"Our experience with Kerr Turbines has been PERFECTLY SATISFACTORY."

"Our experience with Kerr Turbines and your company has been ENTIRELY SATISFACTORY in every way. The machine is doing its work in a SATISFACTORY manner."

"Our experience with Kerr Turbines installed last July is PERFECTLY SATISFACTORY. Results have surpassed our expectations and we are glad to recommend your installation."

"Kerr Turbine running VERY SATISFACTORILY. Service rendered has been VERY SATISFACTORY as well."



KERR TURBINES *must* be satisfactory

ELLIOTT COMPANY

PITTSBURGH, PA.

General Offices JEANNETTE, PA.

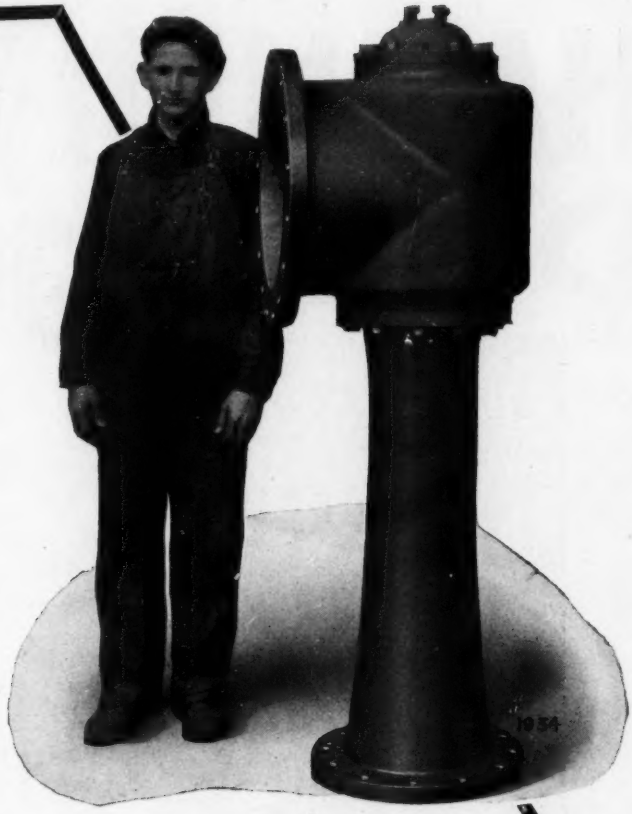
Sales Offices in principal cities

H-499

Mention Where You Saw the Advertisement

High Grade Lubricating Stock

With High Vacuum Distillation



HIGH VACUUM permits distillation of heavy lubricating oils at temperatures below the cracking point. Many crude oils formerly thought unsatisfactory have proven good lubricating stock when distilled under a vacuum. The Wheeler Steam Jet Vacuum Pump will produce a vacuum of 29½ in. and over. Wheeler vapor heat exchangers and oil condensers are specially designed for vacuum service. For further information write the

WHEELER
CONDENSER & ENGINEERING CO.
Works, **CARTERET, N.J.**
and NEWBURGH, N.Y.
Main Office—149 Broadway, New York City

WHEELER
Oil Refinery Equipment
HEAT EXCHANGERS
(Liquid to Liquid)
VAPOR HEAT EXCHANGERS
FINAL CONDENSERS,
VACUUM CONDENSERS,
PARTIAL CONDENSERS
THERMO COMPRESSORS.

Other Products Include:
Cooling Towers,
Surface Condensers,
Steam Jet Air Pumps,
Expansion Joints,
Heaters,
Evaporators,
Centrifugal Pumps,
Brass and Copper Tube and Pipe

LOCAL OFFICES:
Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Havana, Kansas City, Mo., Los Angeles, New Orleans, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., Salt Lake City, Seattle, San Francisco, Vancouver

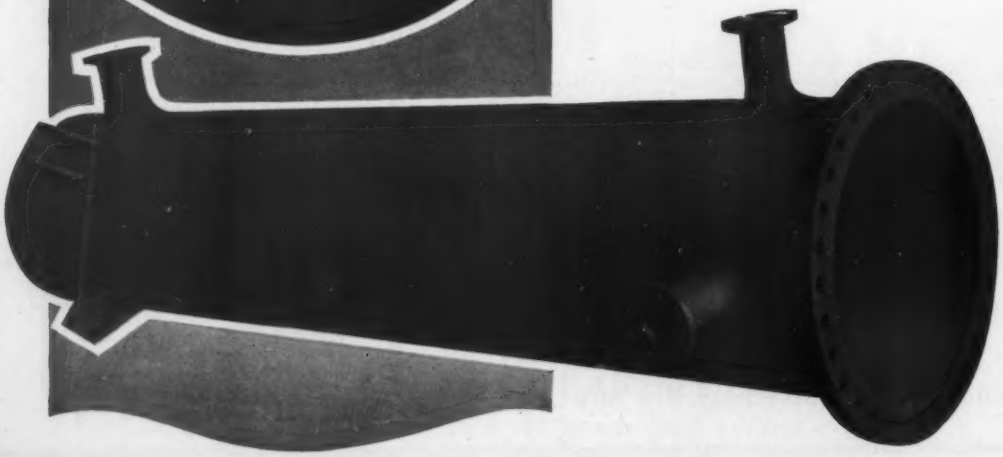
HAMMER-WELDED Dephlegmators

Tanks, Stills, Retorts, Etc.
made from
"NATIONAL"
Hammer-Weld Pipe

DEPHLEGMATORS are only one of the tubular units in refining plants in which smooth surfaces, freedom from rivets and projecting seams and sound welds are desirable. By making dephlegmators, tanks, stills, retorts, etc., from "NATIONAL" Hammer-weld Pipe, which can be furnished plain or partly fabricated and in diameters from 20 inches to 10 feet, many advantages are gained. Such advantages include elimination of leakage and danger from explosions, freedom from undesirable accumulations, and higher efficiency in transmission of fluids and gases because of reduced frictional resistance. For more complete information write for a copy of "NATIONAL" Bulletin No. 13.

NATIONAL TUBE COMPANY
Frick Building, Pittsburgh, Pa.
DISTRICT SALES OFFICES IN THE LARGER CITIES

Enlarged view of nozzle, showing smooth welding to shell of dephlegmator and substantial, efficient character of joint.



—shows the uses and advantages of *MOLTEN METAL COATINGS, APPLIED BY*

METALAYER

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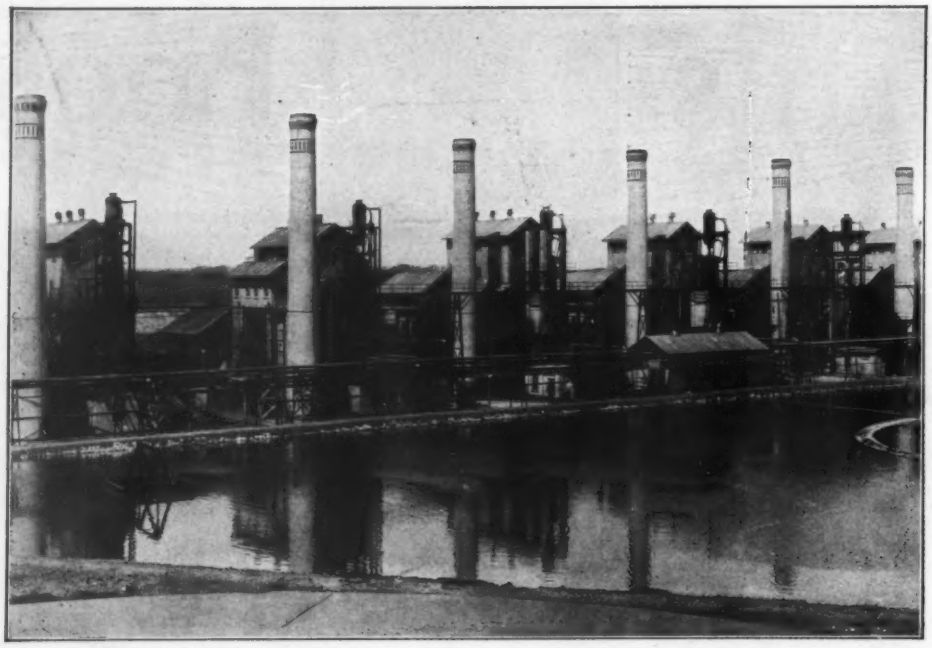

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JOHNS-MANVILLE
Oil Industry Department

Vol. 6, No. 5

MAY, 1927

The REFINER

AND NATURAL GASOLINE MANUFACTURER

Edited Monthly at Tulsa, Oklahoma GRADY TRIPLETT, *Editor*

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Published Monthly by GULF PUBLISHING COMPANY
Copyrighted, 1927

R. L. DUDLEY, *President* — A. L. BURNS, *General Manager* — SPENCER W. ROBINSON, *Editorial Director* — J. KENT RIDLEY, *Managing Editor*

Editorial Office: 214-218 Atco Building, Tulsa, Oklahoma

Office of Publication: 1716 Dallas Avenue, Houston, Texas

NEW YORK: Room 832, 250 Park Avenue, R. P. Swinsky, Manager. *PITTSBURGH*: 510 Park Bldg., W. W. Pigue, Manager. *CHICAGO*: 476 First National Bank Bldg., O. R. Waller, Manager. *LOS ANGELES*: 1201 Haas Bldg., Wm. V. Gross, Manager. *TULSA*: 214-218 Atco Bldg., J. F. Carter, Jr., Manager. *FORT WORTH*: 203 W. T. Waggoner Bldg., H. H. King, Manager. Single copies 20 cents. Domestic Subscription price, $1.00 a year. Foreign Subscription price $1.50 a year. Advertising rates upon application.

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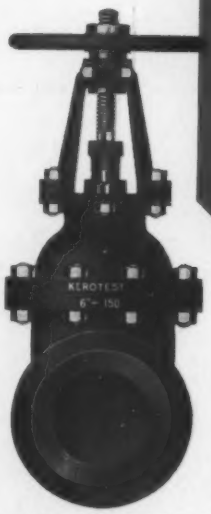

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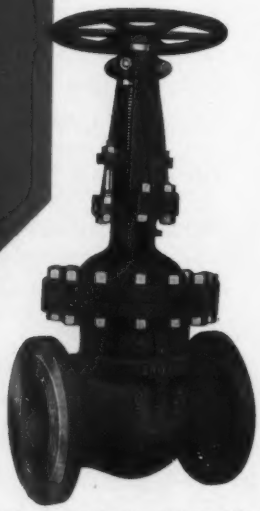

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Let's Have a Longer Look

WHEN refinery balance sheets show losses, the cry goes out for a remedy. Relief is wanted and needed. Still there are few who cry for relief without looking on it as something of only temporary need.

The common remedy offered is to curtail plant operation. That is logical. When done it proves effective. But it is only a temporary relief. When a refiner curtails plant output he does so expecting to be back at capacity operation within a few months.

That applies as well to oil production. The oil producer looks for better times when some flush field has spent its flowing days.

Likewise with natural gasoline. The effort right now is to hold until prices are higher. The one fundamental difference between natural gasoline and other divisions of the industry is that curtailing output is not practical. If gas contracts are to be protected, plants must operate.

What the whole petroleum industry should learn is that a premanent remedy and not a temporary one is needed. Gasoline plant capacity has been expanded to a greater extent than the agencies for its consumption. There is a service station for each 80 automobiles in the United States. And there is sufficient gasoline to fill each tank in the country. Then there is refinery capacity to make gasoline faster than normal automobile consumption can take it from the tanks.

That is a permanent condition. Effective relief must be of the same stripe.

Pleading for temporary relief is not necessary. When gasoline becomes an unprofitable product, economic law steps in to change the condition. A period without profit brings curtailment in output. Those seeking ease for a time can have it without shouting.

But this sort of relief does not reduce the facilities for making gasoline. The only elimination economic law has accomplished is the death of small plants. To offset this other plants have been enlarged.

Then when temporary relief again makes profit possible, facilities are available to put gasoline tanks back to overflowing. And experience gives ample proof that facilities are used to this end.

This discussion is pertinent for just one purpose. Right now the oil country resounds with much pleading for relief. The bulk of the pleading is for just a temporary relief. Men are desirous of a time when profits are again possible. Few are giving consideration to any plan that will give relief a permanent setting.

That is because the vision of the petroleum industry is restricted. Men see but a few months ahead. Consequently they act for a few months for profit making.

Somebody should bring a new note into the song. The petroleum industry is not for a season. Its time should be measured in decades and not in seasons. Its market is one that will grow at a known rate for each year of the decades.

When these decades are cut into months by thought and action, periods of loss, followed by periods of profit, are the result.

Grady Tribbett

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INSURE THE HIGHEST GASOLINE YIELD

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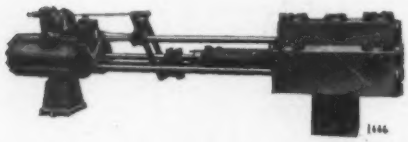
Single Steam Hot Oil Pump with forged steel fluid cylinder and water-cooled Hot Oil Type stuffing box.

Built in different combinations of steam and fluid cylinders to work against 150 to 800 lbs. pressure and will handle hot oil up to 800° F.

A solid steel forging is machined to form the fluid end. Tongue and groove flanged

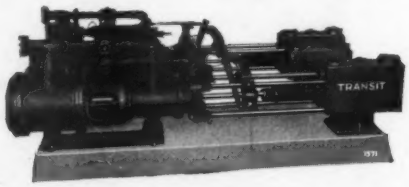


openings packed with sheet aluminum gaskets, insure against leaks; and furthermore in order to prevent any possible leakage at the piston rods, we make a very deep, water jacketed stuffing box, so deep, that the hot part of the rod never runs up into the packing, much less into the open air. Two sets of packing and a lantern gland insure against leakage. This is common to all pumps illustrated on this page.

TRANSIT

twin single hot oil pump with forged steel fluid cylinders and water-cooled Hot Oil Type stuffing boxes. "Twin single" means that two single steam pumps are connected together. Their operation is controlled by a synchronizing device, a part of the valve motion of the pumps.

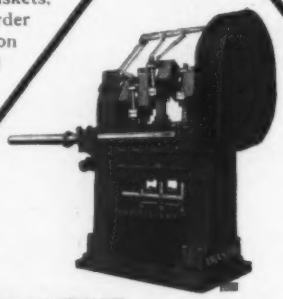
Either of the two single pumps is made large enough to handle the capacity required at nor-



mal speed. When running together, or synchronized, they operate at approximately one-half normal speed. Thus we obtain an easy running, slow speed, long stroke and consequently long-lived machine.

Through this synchronizer control either pump can be shut down at will. Immediately and automatically on shutting down either pump the other pump doubles up both in speed and capacity.

Hot oil up to 1000° F. can be handled at working pressures up to 1000 lbs.



TRANSIT Vertical Triplex Power Pump for hot oil up to 750° F. and to 1050 lbs. working pressure. Normal capacity 170 barrels per hour. This type of pump has many advantages for this important work. (a) Small floor space. (b) Weight of fluid plungers is suspended vertically from the crankshaft, thus relieving the packing of this weight. (c) Three fluid cylinders insure that pulsation is reduced to the minimum. (d) Exact metering, no short stroking.

The fluid end is machined from a solid forged steel billet, the only material we consider strong enough and safe for high temperature oil.

The fluid plunger stuffing boxes are extra long, water-cooled, and fitted with two sets of packing and a lantern gland. With this arrangement no stuffing box leaks are possible.

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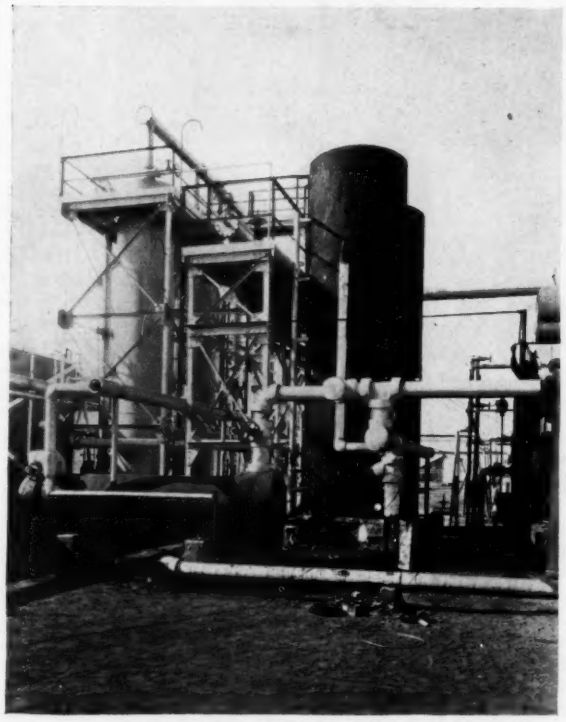
Advances Made in Refinery Vapor Recovery Systems

By GEORGE REID
Staff Representative

INSTALLATION of Vapor recovery systems at the refinery accomplishes two results. The first, and primary purpose for which the recovery systems extracting gasoline from refinery waste vapors is installed, is for the reduction of plant losses and the increasing of plant production of light gasoline. The second result consists of reducing the fire hazard on the refinery yard. A closed system of tanks, receiving house and agitators, effects almost entire elimination of settling and drifting vapors—which in past years have been the cause of many refinery blazes. It is common knowlege that gasoline vapors being heavier than air, will settle to the ground, especially in the absence of wind, being particularly noticeable on foggy evenings and sultry rainy days, when these vapors drift into low spots about the refinery yard and are connected by series of channels to their source of origin. Under such conditions the slight movement of air due to the draft of the furnaces has been known to gradually suck this explosive mixture to the boiler house or still fire to result in a disastrous blaze and subsequent damage to the entire plant. The elimination of a greater part of this hazard is brought about by the installation of closed gasoline recovery systems, and while fires due to open tanks are not numerous, still, the number of blazes resulting from such conditions as described are greatly reduced by the closing of tank vents.

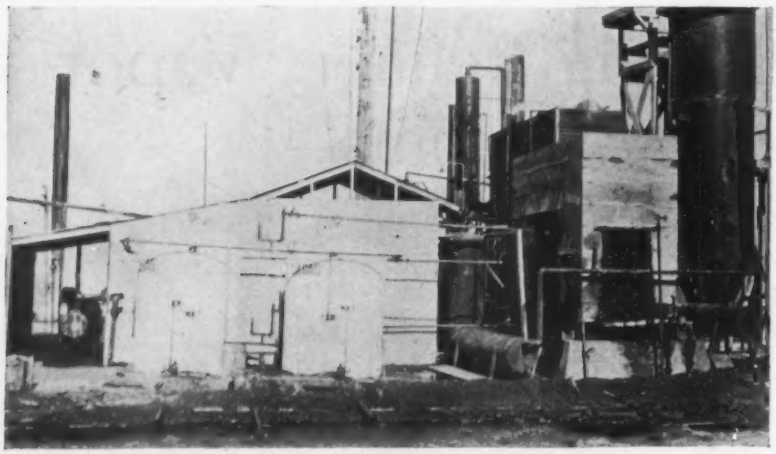


VAPOR RECOVERY PLANT AT MID-CONTINENT PETROLEUM CORPORATION'S WEST TULSA REFINERY.

Vapors generated in the light gasoline tanks, naphtha, benzine, and other light oil containers, as well as those derived from the receiving house and the cracking plant benzine collecting tanks, are almost invariably rich in gasoline content. Analysis of such vapors at hand, from several refining plants, indicates that the recovery which may be expected from such gases may vary from as low as one gallon per thousand feet to 10 gallons—with an occasional higher gasoline content. When the refinery receiving house is not equipped with vapor-tight connections, and the run down tanks are open vented, as well as crude oil and other storage tanks being permitted to vent themselves, then the refiner is certain to sustain a more or less avoidable plant operation loss. These wasted vapors may be economically collected and stripped of their valuable components either by absorption or compression. The light gasoline produced constitutes a valuable product for blending purposes. Its recovery invariably is profitable to the operator and accomplishes more efficient and economical plant operation. During the past few years a great number of refiners have developed recovery systems on their plants and a great number of ideas and innovations have been incorporated in their construction.

Absorption Type

One of the latest complete vapor recovery systems to be installed in the Mid-Continent refining area is that of the major refinery at West Tulsa of the Mid-Continent Petroleum Corporation. In the operation of this large complete refinery and extensive cracking plant installation, which has a rate capacity of 40,000 barrels daily, there is available daily for gasoline extraction purposes between six and seven million cubic feet of gas and vapors. The gasoline recovery plant consists of two Newton 5 by 24 feet absorbers, two stills or distillation units, 6 by 24 feet in size, with the necessary heat exchangers, dephlegmators, preheaters, pumps for circulation purposes. The recovery absorption plant is installed as illustrated in the accompanying photograph. All of the crude oil tanks, the gasoline and distillate storage and run down tanks, the uncondensed vapors from the condensing coils, and the vapors from the cracking coils are conducted through a header line to the recovery plant where they are treated by the absorption system and the valuable light gasoline extracted. Before the installation of the absorption units the company was extracting gasoline form these vapors by the compression method, and the installation of the absorption equipment resulted in the old equipment being employed as a booster plant only. The vapors are conducted through the compressor machines after being scrubbed in the usual gasoline plant practice, and discharged through a second scrubber tank before they are passed through the absorbers. Since the recovery plant is a duplicate of absorption gasoline plants in its operation it is unnecessary to describe its operation in detail here. The plant operates at 30 pounds pressure, and strips the rich vapor of its gasoline content, the condensed gasoline being conducted to storage and utilized for blending purposes, and the residue gas is conducted to the furnaces for firing purposes. When the refinery is operating at average daily throughput, with the cracking units in operation, these two sources, in addition to the various storage tanks about the yard from which vapors are secured, provide gas or vapors to the extent of six to seven million cubic feet per day, as previously



SMALL COMPRESSION TYPE VAPOR RECOVERY PLANT AT LONG BEACH, CAL.

mentioned. From this volume of papors the recovery plant produces around 38,000 gallons of light gasoline per day. From these figures it is estimated that the vapors have a content of from five and one-half to six gallons of gasoline per thousand cubic feet on an average for the entire plant.

Early Methods

This type of gasoline recovery system as briefly described above, represents a great advance in the application of vapor recovery methods over the installations of a few years ago. The first recovery plants consisted of vapor lines leading from the receiving house to a series of tanks which were kept full or partially filled with naphtha. This type of unit was cheap and though inefficient, it pointed the way to the development of the more scientific recovery plants now being installed. In the early day system mentioned, the gas or uncondensed vapors from the worm or condenser coil were removed from the stream of gasoline flowing into the lock box, by means of an enlarged water trap in which water, gasoline and vapors were separated. The look box was air-tight. The vapors from the trap were conducted through vapor lines to the series of small tanks, to be distributed at the bottom of these tanks through perforated pipes, from where it rose through a overlying body of naphtha. The naphtha absorbed a certain amount of the valuable light gasoline, and when it became raised in gravity to a certain predetermined mark, the naphtha was removed and fresh naphtha pumped into the tank. After its semi-absorption in this manner the vapors were released into the open air at a point removed from the stills and furnaces. This type of recovery plant, however, marked the beginning of the study of better efficiency and increased recovery through the extraction of light components of the previously wasted vapors. One authority roughly estimated that a stream of gasoline from a 5000-barrel refinery, flowing into a rundown tank with the vent or gauge hatch open, would cost the refiner about $15 to $20 per day in loss of gasoline which should be and could easily be recovered, valuing the gasoline at 10 cents per gallon.

Smaller Installations

The size and type of the present day recovery plant is naturally governed by the magnitude of the individual plant's operations. A small refinery operating a topping plant at Long Beach, California, for example, installed a small gasoline recovery plant on its plant yard two or three years ago, which was constructed and installed for a cost of $1000. This installation is shown in an accompanying photograph. The plant consists of one Gardner 9x8 single stage compressor driven by a 20-horsepower electric motor. The cooling coil is of one-inch pipe. The accumulator tanks were made by the welder on the plant yard. Water circulation over the coils and the compressor is handled by a small one-horsepower electric motor and a one-inch centrifugal pump. Gas is conducted to the compressor from the receiving or rundown tanks and the "tail house" only. This plant produces from 7000 to 8000 gallons of gasoline monthly, and through this production the original investment is cleared and returned to the company six to eight times each year.

The effective reduction of losses, and the possible increase in revenue through the installation and operation of vapor recovery plants should be of interest to operators of refineries, either large or small. Some authorities contend that no operating refining plant is too small, but that its efficiency can be improved, and its production increased to some extent by the installation of a closed system of vapor control and gasoline extraction. The small operator can no more afford to permit the waste of his finished product, due to evaporation and breathing, than can the larger refineries. The investment required for such recovery plants is less for the small plant, but his returns in gasoline produced or saved are as large in proportion to his crude throughput as are those of his neighboring major refinery. The refinery operating on today's narrow margin finds that it is essential that all losses be reduced to the minimum, and the old days when refineries operated with plant losses ranging from 3 to 5 per cent, are past, and the modern efficient plant, regardless of size, can be operated with a plant loss ranging around 1 per cent. The perfection and development of vapor recovery plants has been conducive in a large measure to the present day efficiency and economy of refining plant operation.

Install Vapor Recovery System

Boston, Mass. — The Cities Service Refining Company, operating an 8500 barrel capacity refinery with 2000 barrel cracking capacity Holmes-Manley units at East Baintree, Massachusetts, is constructing a modern gas or vapor recovery system at this plant. The system will include a gas line to every tank in the yard, by means of which the vapors will be gathered and taken to a central station where an absorption plant will extract the gasoline from the vapors. The receiving house and cracking units will also be the source of rich gases. The non condensible gases will pass to the boiler plant where they will furnish fuel for the boilers. The system serves a two-fold purpose as it not only prevents the escape of the valuable gasoline content of the vapors, etc., but also prevents the escape of much of the objectionable refinery odors.

Empire Starts Gasoline Plant at Seminole

The Empire Gasoline Company's new Livingston absorption gasoline plant in section 15-8-6, Seminole County, Bowlegs fields, was placed in operation during the month of April. The plant is making about 10,000 gallons of gasoline daily, running but a small portion of the potential natural gas supply to be treated. Construction of the plant was started March 20. The Livingston plant was designed to operate on back pressure on the wells from which its wet gas is derived. The equipment used consists of one 5 by 28 foot absorber tower, and one Southwestern type 75 gasoline plant. Three 75-horsepower field type boilers are employed as the power plant. Two water wells on the lease supply water for circulation over the large water cooling tower.

The second new plant of the Empire in this field is its Davis plant, which is similar in size to the Livingston, but consists of C. F. Braun Co. equipment throughout, using two Braun absorber towers. No compressor equipment is installed at either plant. Gasoline manufactured at both plants is pumped to the company's centrally located Lacy plant in the same district.

Redesigned Fractionating System Eliminates Re-Running

Rio Grand California plant now gives greater gasoline yield with lower heat cost

By H. H. KELLY

IN a recent article in the Refiner and Natural Gasoline Manufacturer, a general description of the Rio Grande Oil Company's refinery at Vinvale, Cal., was given before the present alteration to the five dephlegmating towers and five shell stills were made.

At that time the commodities manufactured were gasoline, kerosene distillate, gas oil, and residium, also benzine, which was a cut between the gasoline and the kerosene. The latter commodity had to be re-run. During July, 1926, it was decided that W. F. Pyne, manager of refineries for the Rio Grande Oil Company, be given the opportunity to re-design the existing towers to see if a better percentage of gasoline could not be obtained, also to re-arrange the still piping to suit the requirements of the modified towers.

The first move made was to lower a spare tower 6 feet in diameter by 23 feet 6 inches in height from the top of the condenser boxes and ship it to the shops of an outside contractor in Los Angeles, where the old internal drum was taken out and the shell refabricated with a series of trays and a special type of bubble cap.

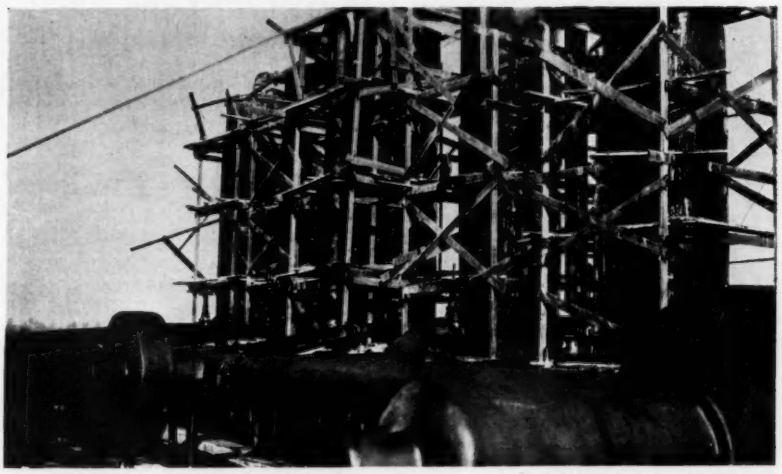


FIGURE 2—CLOSE-UP OF THE NEWLY INSTALLED TILE PACKED TOWERS AND RECTIFIERS IN USE WITH THE NEW FRACTIONATING DEVICES. NOTE VAPOR LINES EQUIPPED WITH DRUM OR BALLOON TYPE EXPANSION JOINTS.

Vapors From Crude

It was then returned to the refinery, placed on a concrete foundation at the north end of the condenser boxes and made to act as a vaporizer.

The crude oil after being passed through the interchanger was taken direct into the vaporizer and the vapors from the tower were taken direct through the No. 1 condenser box to No. 1 look box. Tower bottoms were picked up by a 7½ in. x 8½ in. x 6 in. Worthington duplex pump and discharged direct to Nos. 1, 2 or 3 stills.

This initial alteration in releasing the light vapors from the crude proved satisfactory and the next step was then taken, which was the reconstruction of the remaining towers.

This necessitated the shutting down of the plant, but sufficient gasoline had been accumulated in the storage tanks so that the sales end of the company was not restricted in any manner.

Bids were asked for the work and the contract finally awarded to a company which decided to do the work in its own shops, shipping the 6 ft. x 23 ft. 6 in. towers again, a distance of 10 miles.

Pumps Rearranged

While the towers were being refabricated work was started on the installation of additional pumping units, required by the new arrangement, and their necessary suction, discharge, steam and exhaust piping.

These pumps, 3-Worthington 7½x8½x6 were placed under the condenser boxes adjacent to the old units, which were repiped to suit the new conditions.

Also four small 3x2¾x3 in. Worthington duplex steam pumps were placed under the tail house to act as reflux pumps for the towers. Their common suction line being taken from the run down tanks.

The still traveling line was altered at this time so that stills 1 and 2 could be by-passed in case of trouble and the hot crude from the interchangers sent direct to stills 3 and 4.

Also as many bends as possible were eliminated from the traveling line both front and back of stills to allow easy flow of the oil and lessen friction loss. Ten-inch expansion pieces of the sliding type were fitted between the stills 1 and 2.

Then came the question of vapor piping. It was originally made of 10-inch

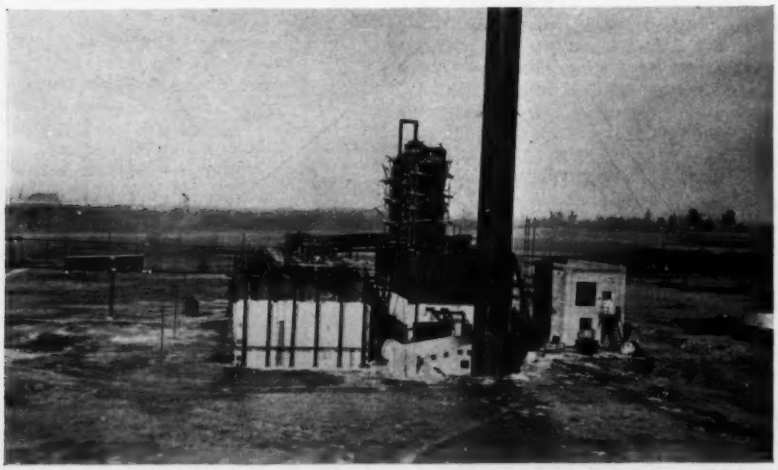


FIGURE 1—GENERAL VIEW OF RIO GRANDE'S VINVALE PLANT, JUST AFTER THE COMPLETION OF FRACTIONATING EQUIPMENT INSTALLATION WHICH REVISED THE SYSTEM OF PLANT OPERATION.

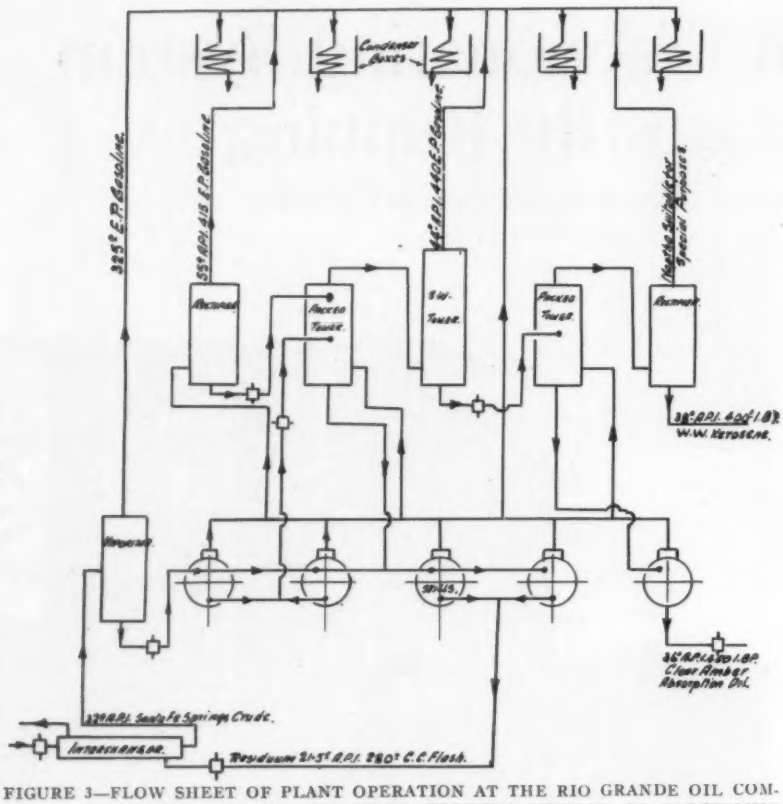


FIGURE 3—FLOW SHEET OF PLANT OPERATION AT THE RIO GRANDE OIL COMPANY'S VINVALE CALIFORNIA REFINERY, SHOWING METHOD OF PROCESSING AFTER REDESIGNING THE FRACTIONATING SYSTEM.

solid drawn tubing with screwed fittings to take up expansion. There had always been trouble with the still brick setting breaking just below the bottom and sides of the still drum, and in two instances a vapor pipe had pulled out of a flange where it joined the tower. Taking these matters into consideration it was finally decided to do away with the screwed fittings, weld all piping and take up the expansion of both stills and 10-inch pipe in 10-inch steel balloon expansion joints. These were made of quarter-inch welded plate 46 inches in diameter by 6 inches wide, and proved very efficient in all ways, even to taking up the racking of the stills, and no further trouble has been experienced with the still brick settings.

Flexibility Accomplished

The vapor pipe header and condenser box header were manifolded and slip blanks and slip rings fitted in lieu of valves except at places where it was necessary to make changes while operations were under way. This allowed vapors from any still to be passed through any required tower and vapors from the towers put through any particular condenser box. It also eliminated the necessity of shutting down any tower for repairs to condenser boxes, besides giving a greater flexibility of operation on the stills.

At this time the towers were replaced on top of the condenser boxes and arranged in series with the center tower which is a Southwestern bubble tower. The first tower, as previously stated, being used as a primary vaporizer from the interchanger. The second and third tower are packed towers of tile packing.

The back trap from No. 2 tower was re-distilled in No. 3 and No. 4 stills and the back trap from No. 4 tower was re-distilled in No. 5 still. The open steam coils inside the stills were also re-designed to minimize cracking.

Superheater Added

A unique feature was added by placing a steam superheater inside the still flue, close to the stack where the temperatures are highest. There is a long steam line from the boiler house to the still pump house, and consequently trouble was experienced in operating these pumps due to too much saturation of the steam, but after the steam was by-passed through the superheater this trouble was overcome.

The superheater consisted of a single row of ten 2-inch pipes about 15 feet long welded into two 10-inch headers supported on steel frames. The arrangement is simple but very effective. Aditional regulators were fitted to the boilers, but no alteration made to the main steam line, as enough steam was generated and conserved with the new superheater to supply all pumps.

The light gasoline from the vaporizer was also stabilized to conserve uncondensed gases from the vaporizer condenser box so that gasoline losses were virtually eliminated.

The condensed steam was also trapped off before the steam reached the look boxes; this minimized the necessity of draining off water from the run down tanks.

Control Equipment

One thermostatic control on the center tower was all the thermo-couple thermometers on the stills.

Gauge glasses were placed on all towers and each still to indicate liquid levels.

One condenser box was set aside as reserve so that vapors could be turned in quickly in case of trouble on Nos. 3, 4 or 5 stills.

The whole job was very thoroughly insulated and whereas before the problem was to get enough fire under the stills, the problem now is to keep the fires sufficiently low to operate.

The cracking of the oil and the entrainment of heavy ends has been entirely done away with and consequent simplification of the treating problems has resulted.

At the agitators a new 1500 barrel bolted tank was installed so that after treating a batch it could be pumped to this tank and tested to make certain that it was of the quality desired before sending to the gasoline storage tanks. A new filter press of the Sweetland type was also fitted together with the necessary pumps to work in conjunction with the agitators.

Results

The whole job cost just 16 per cent of the initial cost of the battery and the resultant products are: Marketable gasoline recovery, 50 per cent increase; residium, 12 per cent decrease; kerosene, water-white. A small amount of amber colored absorption oil is also recovered, and as a final achievement there is now no re-running to be done.

Humble's West Texas Refinery Operating

The new plant of the Humble Oil & Refining Company at McCamey in Upton County is now in operation. The plant has four tube stills equipped with bubble towers, with a rated capacity of 10,000 barrels. Crude is coming from the Crane-Upton field, one of the principal producing areas of the West Texas district. Approximately 70 per cent of the crude charge is secured as bottoms, or fuel oil. The vaporized portion includes a 400 e. p. gasoline and a heavier distillate used as fuel for internal combustion engines.

Treating equipment is being installed for the purpose of preparing finished gasoline at the plant, which will be marketed in the McCamey territory. Fuel oil has been contracted to the Southern Pacific, the Orient and Santa Fe railroads.

Additional distillation equipment is being constructed which will increase the capacity to 12,000 barrels daily. The plant was constructed under the supervision of J. M. Finley, general superintendent of Humble refineries, and R. X. Cook, formerly superintendent at the company's Burkburnett refinery, has been made superintendent of the new plant.

Treatment of Cracked Naphtha With Sulfuric Acid at Low Temperatures

By E. N. KLEMGARD

THE investigation of methods of removing the sulfur compounds from naphthas obtained by cracking California charging stock, has been carried on by various petroleum technologists resulting in several processes. However it is believed by the writer that none of these are as effective and economical as the method of treating naphtha at low temperature with strong sulfuric acid.

While it is true that the Aluminum Chloride process of cracking and refining California stocks results in products of high quality, the high cost of producing the aluminum chloride in conjunction with an uncertain status of the patent situation is doing much to retard advancement in this direction. Doc treatment (sodium plumbate), hypochlorite processes, chlorine treatment, and sulfuric acid treatment at ordinary temperatures or temperatures down to 25 degrees F. have all been shown to either be ineffective in reducing the sulfur content to below .10 per cent or for those cases in which it was possible to reduce the percentage of sulfur satisfactorily heavy losses of test gasoline due to plymerization are generally encountered.

It is not the writer's object to enter into a lengthy discussion or controversy on the relative merits of the various existing and proposed methods of refining California cracked naphtha but rather to point out some of the advantages of the low temperature process of refining naphtha with strong sulfuric acid.

It is apparent to all of those who have investigated the processes for refining cracked stocks that it is not sufficient to take into account only the volume loss during the refining process, but that due consideration for the increase in the boiling points of the various hydrocarbon constituents must also be made.

This increase in the boiling points is in general conceded to be due to the action of the sulfuric acid on the cracked naphtha to polymerize the monoolefins, to form dialkyl sulfuric esters and to oxidize a portion of the unsaturated hydrocarbons. It will be readily understood that in order to know the extent of the polymerization loss due to treatment the exact amount of increase in the boiling points of the hydrocarbons constituting the cracked naphtha must be known. While a rough estimation of the extent of polymerization may be made by comparing "Bureau of Mines" distillations or fractionations it is believed that the most satisfactory is to actually determine the percent of test Gasoline in the naphtha before and after acid refinement. The determination of the amount of test gasoline is most readily made by the four point control method which may be outlined as follows:

Four Point Control

Apparatus: The source of heat for the distillation is preferably an ordinary Bunsen burner provided with a pinch cock for close adjustment. The flask used is a No. 26 Pyrex distillation flask having a 10-inch column 1⅛-inches in diameter. The fractionating column is filled with No. 18 iron jack chain. The chain should fill the column for a distance of at least 6½-inches. Thermometers of the usual 381 mm, B. of M. standard distillation are prefered. The condenser is the type prescribed for the B. of M. Distillation test. The distillate is received in a 250 ml graduated cylinder, which during the test is surrounded by an ice and salt mixture to reduce the temperature and prevent the loss of highly volatile material. Moist cotton is packed around between the condenser tube and the mouth of the receiver.

Procedure: At a temperature of 40 to 50 degrees F. measure out a portion of the distillate or naphtha with a pipette or graduated cylinder, which will just be equal to 300 ml at a room temperature of 80 degrees F., and pour it into the distillation flask using a funnel. Carry out the distillation at a uniform rate of one or two drops per second, noting the volumes over at 130, 221, 284, 392, and 437 degrees F. and correct to standard temperature. The percent off at each temperature is then calculated by dividing by 300. The per cent off at 221 is multiplied by 5, that at 284 by 2, that at 392 divided by 9, and that at 437 degrees F. multiplied by unity to obtain the calculated per cent of test gasoline at the test points.

Another distillation in the same equipment is then made, taking off the *lowest per cent* of test gasoline indicated by the calculation from the first distillation. A. B. of M. fractionation test is then made on this final distillate to determine if it is true test gasoline. A variation of 2 degrees F. above the specified test points is allowable, and if the temperatures fall within this limit, the lowest per cent as calculated and run to, is taken as the per cent of test gasoline in the naphtha. In routine work on untreated naphtha only one distillation of the 300 ml sample may be made, the cut being made at 384 to 386 degrees F. This usually gives a gasoline passing all of the B. of M. test points with a control of 284 degrees at the 50 per cent point. For treated cracked naphtha in which the treatment has been carried out at ordinary temperatures the cut is made at 376 to 280 degrees F.

By using a method of this kind on the cracked naphtha before and after treatment it is possible to get a very accurate determination of the polymerization loss in terms which may be calculated as the per cent loss of gasoline due to polymerization and if the procedure is carried out carefully the losses due to volatilization of light fractions are almost negligible.

Treatment Under Normal Conditions

The per cent of test gasoline in the crude or untreated naphtha varies in accordance with gravity as shown in the following table:

Percent Test Gasoline	Gravity °Be. Naphtha
51.3	44.8
58.4	46.4
64.2	47.6
69.0	48.9
83.1	52.9

The properties of a typical crude pressure naphtha on which the approximate results obtained by treating with sulfuric acid under normal conditions in a commercial continuous treating system and subsequently in an experimental cold-treating plant may be listed as follows;

Crude Pressure Naphtha	
Gravity °Be.	44.6
Percent Sulfur	.55
Percent "Acid Oils" (Phenols, Cresols, etc.)	.35
Percent "Navy" test gasoline.	51.00

This naphtha is treated with nine degrees Be. caustic soda solution to remove hydrogen sulfide, the greater portion of the "acid oils" and other impurities. In a commercial plant operating continuously this caustic pretreatment may be carried out by introducing the soda solution into the suction side of a centrifugal pump. From this pump the naphtha and caustic soda solution pass through a pipe equipped with baffles to the bottom of a settler seven feet in diameter and 30 feet high. From four to 10 per cent by volume, of the caustic soda solution gives satisfactory results. The spent

caustic is drawn from the bottom of the settler and returned to a storage tank for re-use and where the alkalinity may be increased and maintained at some predetermined standard.

Ten of the 7x30 feet treaters may be effectively untilized in a continuous treating system of this kind. In the second treater the naphtha is treated with salt water, the water being sprayed through the naphtha in counterflow relation. The naphtha may then be passed to the third treater which is merely a settler to remove water before the naphtha is treated with acid in the fourth treater. One half pound of acid per gallon of naphtha handled, may be sprayed on the oil passing through the treater or more effectively be introduced into a centrifugal pump located in the line connecting the third and fourth treaters. The fifth treater should be a settler, the sixth and seventh may be used for washing sludge from the oil with salt water, the eighth may preferably be used for applying about four per cent by volume of caustic soda of five to 10 degrees Be. gravity. With the 10 treaters used in this way the last two may be utilized as settlers.

Naphtha Properties

The acid sludge drawn from the bottom of the fourth and fifth treaters may be pumped to a storage tank from which the supernatant naphtha can be skimmed at intervals. Even after accounting for the oil from the acid sludge as much as 10 per cent of the total volume of the naphtha treated is lost, although with careful control the treating yield should be about 96 per cent. The properties of the finished treated naphtha are as follows:

Treated Pressure Naphtha:

Gravity °Be.	43.0
Percent Sulfur	.45
Percent "Acid Oils"	Trace
Percent "Navy" test gasoline	43.5

The difference between the percent test gasoline in crude and treated naphtha is 7.5 percent, but this amount represents a loss of 14.7 percent of the total gasoline in the crude naphtha. There is an additional loss of about two percent of the total gasoline due to the volumetric loss, assuming a treating yield of 96 per cent.

It is evident that about 16.7 per cent of the total Navy test gasoline in the Crude Naphtha has been lost due to refining. Since this Cracked Naphtha after treatment is distilled with steam to recover the gasoline a further loss is encountered due to voltilization of light hydrocarbons. However it may be said that treating naphtha in a closed system as described is subject to considerable less loss than in open treaters where air is used for agitation. The rate of treating for the values given is 250 barrels per hour.

The quality tests on the gasoline obtained from steam distilling the Treated Pressure Naphtha are as follows:

Finished Gasoline

Gravity °Be.—54.1.

Doc Test—NG.

Color—25 Plus.

Copper Bowl Test—Poor (84mg of gum).

Copper Strip Test—Fair (Gasoline yellow).

Percent Sulfur—.14.

Percent Unsaturates—17.

It is of note that in this method of treatment the temperature of the naphtha at the time it was in contact with the naphtha at times was in excess of 140 degrees F. In laboratory treatments, however where the treatment was carried out at a temperature below 80 degrees and above 40 degrees F. the polymerization losses were approximately the same. These details of treatments under ordinary conditions have been given in order to emphasize the advantages of the treatment at low temperatures.

Treatment at Temperature Below 20 Degrees F.

When the crude naphtha was treated in the cold it was found that the water it carried was frozen and clogged the lines so that continuous treatment could not be carried out, however by passing the naphtha through a layer of acid sludge before refrigerating, this difficulty is eliminated. The naphtha is cooled in heat-exchangers consisting of jacketed pipes by means of amonia, the usual type of compressor as used in ice plants being found satisfactory. After the naphtha has reached a temperature of 150 degrees F. it passes to a centrifugal pump where strong sulfuric acid, either 66 degrees Be. or 150 degrees fuming acid is mixed with the naphtha. Two tenths of a pound of acid per gallon of naphtha may be mixed with the naphtha at this point. It is now found desirable to cool the acid and oil again by passing it through another heat exchanger in order to maintain a temperature of 150 degrees F. as the action of the acid on the oil has a strong tendency to cause an increase in the temperature, and as the success of the proceeds depends on keeping the temperature below 20 degrees and preferably at 15 degrees F., adequate cooling surface must be provided.

From the second cooler the naphtha and acid pass to an insulated settler where the larger portion of the acid settles from the mixture, the naphtha is again refrigerated and passes to a second centrifugal pump where another portion of sulfuric acid in the proportion of two-tenths of a pound of acid per gallon of naphtha is applied; the mixture once more refrigerated and run into a second settler. From this point on the naphtha is finished as in treating cracked naphtha under ordinary condition, i.e., several treaters are employed for washing and neutralizing the acid treated naphtha. The naphtha treated in this way has the following properties:

Cold Treated Pressure Naphtha

Gravity, degrees Be.	44.1
Percent Sulphur	.30
Percent Navy Test Gasoline	49.0

The difference between the per cent navy test gasoline in the crude and cold treated naphtha is only two per cent which represents 3.9 per cent of the total gasoline in the crude naphtha. The acid sludge formed in this treatment is very low in viscosity and is easily handled in acid recovery plants, it also separates readily from the naphtha and treating yields of 98 per cent can be obtained. The quality tests on the gasoline obtained from steam distilling the treated naphtha are as follows:

Finished Gasoline from Cold Treated Naphtha

Gravity, degrees Be.	55.0
Doc Test	OK (in most cases)
Color	Plus 25
Copper Bowl Test	Fair, little gum
Copper Strip Test	Fair (Gasoline yellow)
Per cent Sulphur	.09
Per cent Unsaturates	20

It appears that by the cold treatment of California cracked naphtha it is possible to produce a superior gasoline than by the usual treatment and in addition about 10 per cent of the total gasoline in the crude naphtha may be saved from polymerization. In the light of these remarkable results considerable interest has developed in the refining industry and it is probable that at least one commercial plant having a capacity of from 300 to 500 barrels per hour will be constructed in the near future. It is of note that the data given in this paper represents averages rather than the results of one particular experiment.

Montana Gasoline Output

Helena, Mont.—A report of the Montana board of equalization indicates that 14 refineries in this State during 1926 did not produce sufficient gasoline to meet local demands. Gasoline production of the plants was 37,212,681 gallons, of which 33,162,804 gallons was consumed locally and 4,049,877 gallons marketed outside of the State.

Montana consumed 48,604,801 gallons during the year, involving the importation of 15,441,997 gallons to offset the deficit of 11,392,120 gallons plus outside shipments.

Lewiston Oil & Refining Company at Lewiston, which manufactured 14,032,974 gallons of gasoline has the largest output of all refineries in the State. Arro Oil & Refining Company, also at Lewiston, was second with 7,851,317 gallons, and Sunburst Refining Company at Great Falls was third with 6,481,217 gallons.

Marked Increase in Cracking Capacity

Survey shows Texas leading in units and throughput with California building more new pressure systems

By GEORGE REID
Staff Representative

OF the 465 completed petroleum refineries in the United States, of which, according to latest Bureau of Mines estimates, 327 are in operation and 138 shut down, there are 177 plants equipped with or installing cracking units.

Comparison of this survey with that of the first part of 1926 reveals that there has been a marked growth in the number of plant operators who are turning to cracking their heavier fractions for the purpose of increasing their gasoline production. Reports for 1926 give the total of operators employing cracking methods as 150, 27 less than the current survey indicates.

The 177 refineries equipped with cracking facilities have an estimated total skimming plant capacity of 2,245,510 barrels daily, while the cracking capacity of these refineries is estimated at 1,246,730 barrels. The total combined cracking and skimming capacity is 3,492,240 barrels. The cracking capacity of the 177 plants so equipped is within 998,780 barrels of the skimming capacity of those plants.

It is interesting to note that the cracking units in the United States have a rated capacity but a little less than half of the total operating capacity of all this country's 465 listed refineries.

Last year 150 refineries with cracking equipment reported an aggregate cracking capacity of 980,960 barrels. The 1927 survey indicates an increase in cracking capacity of over a quarter million barrels, with the present estimated throughput now given as 1,246,730 barrels.

Texas Leads

The 177 refineries operating "crackers" are distributed throughout 25 states. Texas leads in both the number of plants where cracking is done, there being 29 installations, and in total daily capacity, this figure being 289,500. There was an increase of six cracking unit installations and of 63,750 barrels capacity over last year. In California, which has been relatively slow to adopt the cracking unit, there were seven installations last year having an estimated capacity of 50,600 barrels, while this year's resume indicates that 12 installations and proposed units (building or planned), with the capacity increased to 117,800 barrels,—or more than double the 1926 capacity. One new Holmes-Manley unit gives Colorado an increase of 1500 barrels, but with only two refining companies operating. Illinois gained one operator, increasing from seven installations to eight, and a capacity increase of 8,700 barrels. Kansas shows a gain of two installations and an additional 5000 barrels capacity. Louisiana capacity increased 9200 barrels with two more refineries resorting to cracking procedure.

In Maryland the capacity was almost doubled, from 22,000 barrels last year to 43,200 barrels at present, through the doubling of capacity by the Standard Oil Company of New Jersey at Baltimore. Only three refineries in Maryland have cracking equipment.

Enlargement of cracking installations by the five operators in New Jersey during the past year has brought the estimated capacity for the State from 86,100 to 139,900 barrels.

Oklahoma, which is the second largest "cracking" territory, has a total of 26 refineries so equipped this year, a gain of two. These are the Bell Oil & Gas Company installation of Dubbs units and the Garber Refining Company's Jenkins unit. Additions and improvements in the State are responsible for the increase in capacity from 93,550 barrels last year to 101,400 barrels.

In South Carolina the Standard Oil Company (New Jersey) at Charleston, has increased its capacity of Burton and Tube and Tank units from an estimate of 13,000 barrels in 1926 to the present capacity of 28,855 barrels. The one refinery in Utah operating cracking units, the Utah Oil Refining Company at Salt Lake City, through the installation of one Holmes-Manley unit has an increased capacity of 1000 barrels. This company's other units are Burton.

The cracking capacity in West Virginia was bolstered up by the addition of Holmes-Manley units at the Ohio Valley's St. Marys refinery, and Standard Oil Company's increase of Tube and Tank equipment—the two showing an increase of 4665 barrels capacity, from 2160 last year, making the present total capacity 7825 barrels.

Building in California

The other states not mentioned above remain about the same in number of operations and capacity. The resume indicates that there have been a number of new installations made throughout the United States, with all of the leading cracking processes sharing in the new developments. There is more building and new capacity under construction in California than in any other state. The Associated Oil Company, operating a Dubbs unit at Avon, California, proposes the construction of 3000 barrels capacity. California Petroleum Corporation is completing a 4000-barrel installation of Holmes-Manley equipment. General Petroleum Corporation proposes 1500 barrels of cracking capacity. The Olympic Refining Company at Long Beach is experimentally operating a 500-barrel unit of National (Peckham). Pan American has increased its Black-Cross installation. The Richfield Oil Company at Hynes, has increased its Cross cracking unit capacity from 2000 to 6000 barrels. Both the Shell Company and the Standard Oil Company of California are more than doubling their Dubbs cracking equipment. It is

TABLE 1

State	Number Refineries Cracking	Crude Skimming Capacity Barrels	Cracking Capacity Barrels
Arkansas	5	23,600	12,550
California	12	587,500	117,800
Colorado	2	3,250	1,900
Georgia	1	4,500	665
Illinois	8	92,700	63,700
Indiana	6	97,600	101,000
Iowa	1	1,500	1,500
Kansas	17	116,200	64,600
Kentucky	6	18,500	8,700
Louisiana	6	123,000	59,800
Maryland	3	46,000	43,200
Massachusetts	2	22,500	3,800
Missouri	3	15,500	16,500
Montana	1	2,600	800
New Jersey	5	241,000	139,900
New York	2	30,000	12,000
Ohio	8	40,500	33,000
Oklahoma	26	214,500	101,400
Pennsylvania	21	127,560	70,135
Rhode Island	1	10,000	6,700
South Carolina	1	15,000	15,855
Texas	29	309,000	289,500
Utah	1	4,500	5,000
West Virginia	2	5,000	7,825
Wyoming	8	93,500	68,900
Total 25 States	177	2,245,510	1,246,730

Total Capacity—3,510,240.

U. S. Cracking Capacity by Companies and States

Company	Location	Daily Capacity	Type of Plant	Capacity	Cracking Units & Type
ARKANSAS—		**23,600**		**12,550**	
Houston Oil Co. of Texas	Camden	5,000	Skim.	3,000	Dubbs
Kettle Creek Refining Co.	El Dorado	5,000	Skim.	2,000	Dubbs
Lion Oil Refining Company	El Dorado	10,000	S.& L.	5,000	Burton
Ouachita Valley Rfng. Co.	El Dorado	1,600	Skim.	750	Dubbs
Root Refineries	El Dorado	2,000	Skim.	1,800	Dubbs
CALIFORNIA—		**587,500**		**117,800**	
Associated Oil Company	Avon	60,000	Comp.	800	Dubbs
				3,000	Proposed
California Petroleum Corp	Watson	30,000	Comp.	4,000	Holmes-Manley
General Petroleum Corp.	Los Angeles	55,000	Comp.	1,500	Proposed
Eureka Refining Company	Los Angeles	5,000	Comp.	5,000	Eureka
Olympic Refining Company	Long Beach	4,000	Topping	500	National
Pan American Pet. Corp.	Wilmington	60,000	Comp.	10,000	Black-Cross
Richfield Oil Company	Hynes	26,000	Skim.	2,000	Cross
				4,000	Cross Bldg.
Shell Company of California	Martinez	41,000	Comp.	8,000	Dubbs
Shell Company of California	Wilmington	56,500	Comp.	8,000	Dubbs
				16,000	Dubbs Bldg.
Standard Oil Co. (Calif.)	El Segundo	100,000	Comp.	24,000	Dubbs Bldg.
Standard Oil Co. (Calif.)	Richmond	100,000	Comp.	2,500	Dubbs
				18,500	Dubbs Bldg.
COLORADO—		**3,250**		**1,900**	
Union Oil Company	Wilmington	50,000	Comp.	10,000	Cross
Continental Oil Company	Florence	2,500	Skim.	1,400	Burton
The Texas Company	Craig	750	Comp.	500	Holmes-Manley
ILLINOIS—		**93,200**		**63,700**	
Indian Refining Company	Lawrenceville	17,500	Comp.	10,000	Cross-Dubbs
Lemont Refining Company	Lemont	1,000	Skim.	1,000	Lemont
Lincoln Oil Refining Co.	Robinson	1,200	Wax	5,000	Holmes-Manley
Lubrite Refining Company	E. St. Louis	3,000	Skim.	1,200	Fleming
Roxana Petroleum Corp.	Wood River	40,000	S. & L.	17,400	Cross-Dubbs
Standard Oil Co. (Ind.)	Wood River	20,000	Comp.	20,000	Burton-Holmes-Manley
The Texas Corporation	Lockport	4,500	S. & L.	6,600	Holmes-Manley
White Star Refining Co.	Wood River	5,500	Skim.	2,500	Holmes-Manley
INDIANA—		**97,600**		**101,000**	
Bartles-Maguire Oil Co.	E. Chicago	2,500	Crac.	3,000	Jenkins
Interstate Gaso. Co. (S. D.)	E. Chicago	2,500	S. & C.7	500	Greenstreet
Port Jay Refining Company	Portland	600	Skim.	500	Fleming
Roxana Petroleum Corp.	E. Chicago	16,000	Skim.	7,000	Dubbs
Sinclair Refining Company	E. Chicago	24,000	Comp.	30,000	Iron
Standard Oil Co. (Ind.)	Whiting	52,000	Comp.	60,000	Burton-Holmes-Manley
IOWA—		**1,500**		**1,500**	
Omaha Refining Corporation	E. Omaha	1,500	Skim.	1,500	Cross
KANSAS—		**116,200**		**64,600**	
Arkansas City Refining	Arkansas City	6,000	Comp.	1,400	Dubbs
Barnsdall Refineries, Inc.	Wichita	4,000	Skim.	2,500	Dubbs
Berby Oil Company	Wichita	5,000	Skim.	2,300	Dubbs
Golden Rule Refining Co.	Wichita	1,000	Skim.	1,200	Jenkins
Grant Oil Company	Augusta	2,500	Skim.	1,000	Jenkins
Kanotex Refining Co.	Arkansas City	8,500	Skim.	2,200	Jenkins
Kansas City Refining Co.	Kansas City	7,000	Skim.	1,500	Wellman

Company	Location	Daily Capacity	Type of Plant	Capacity	Cracking Units & Type
OHIO—		**40,500**		**33,000**	
National Refining Company	Findlay	1,500	Comp.	1,000	National
National Refining Company	Marietta	500	Wax	500	National
Paragon Refining Company	Toledo	8,000	Wax	3,000	Dubbs
Pure Oil Company	Heath	5,000	Skim.	6,000	Cross
Solar Refining Company	Lima	6,500	Comp.	6,000	Burton-Cross
Standard Oil Co. (Ohio)	Cleveland	8,000	Comp.	8,000	Burton
Standard Oil Co. (Ohio)	Toledo	10,000	Comp.	8,000	Burton
Steller Refining Company	Marne	1,000	Comp.	500	Leamon
OKLAHOMA—		**214,500**		**101,400**	
Barnsdall Refineries, Inc.	Barnsdall	6,000	Comp.	4,000	Cross
Barnsdall Refineries, Inc.	Okmulgee	10,000	Skim.	4,000	Cross
Bell Oil & Gas Company	Grandfield	2,500	Skim.	1,200	Dubbs
Bolene Refining Company	Enid	4,000	Skim.	2,000	Jenkins
Champlin Refining Co.	Enid	16,000	Wax	4,000	Cross
Empire Refineries	Cushing	7,000	Skim.	1,500	Doherty
Empire Refineries	Okmulgee	3,000	Wax	1,000	Doherty
Empire Refineries	Ponca City	7,500	Wax	5,000	Doherty
				3,000	Dubbs Bldg.
Garber Refining, Inc.	Garber	3,500	Skim.	1,000	Jenkins
Globe Oil & Refining Co.	Blackwell	5,000	Skim.	750	Cross
Imperial Refining Co.	Ardmore	6,000	Skim.	2,000	Dubbs
Independent Oil & Gas Co.	Okmulgee	6,000	S. & L.	1,000	Jenkins
Johnson Oil Refining Co.	Cleveland	3,500	Skim.	4,000	Dubbs
Marland Refining Company	Ponca City	25,000	Wax	17,000	Fleming-Dubbs Cross
Mid-Continent Pet. Corp.	W. Tulsa	40,000	Comp.	12,000	Mid-Continent
Pierce Petroleum Corp.	Sand Springs	8,000	Wax	4,000	Cross
Producers & Refiners Corp.	W. Tulsa	6,000	Skim.	3,000	Dubbs
Pure Oil Company	Ardmore	7,000	Skim.	2,000	Dubbs
Pure Oil Company	Muskogee	5,000	Wax	4,000	Cross
Sapulpa Rfg. Co.	Sapulpa	6,500	Skim.	3,600	Cross
Shaffer Oil & Refining Co.	Cushing	10,000	Comp.	3,500	Dubbs
The Texas Company	West Tulsa	10,000	S. & L.	13,600	Holmes-Manley
Texas Pacific Coal & Oil Co.	Wynnwood	2,500	Skim.	1,000	Dubbs
Tidal Refining Company	Drumright	6,000	Skim.	1,300	Slagter
Transcontinental Oil Co.	Bristow	6,000	Skim.	1,350	Slagter
Transcontinental Oil Co.	Baynton	2,500	Skim.	600	Slagter
PENNSYLVANIA—		**127,560**		**70,135**	
American Oil Works Co.	Titusville	600	S. & L.	200	Fleming
Atlantic Refining Company	Franklin	7,000	Comp.	6,000	Lewis-Cross
Atlantic Refining Company	Philadelphia	50,000	Comp.	20,000	Lewis-Cross
Atlantic Refining Company	Pittsburgh	5,000	Wax	5,250	Lewis-Cross
Butler County Oil Rfng. Co.	Bruin	1,000	Wax	400	Bruin
Crew Levick Company	Petty Island	3,000	Skim.	3,000	Eastern Oil
Franklin Creek Rfng Corp.	Franklin	600	Lube		
Emlenton Refining Co.	Emlenton	800	Wax	250	Snodgrass
Freedom Oil Works Co.	Freedom	2,000	Wax	300	Freedom
Freedom Oil Works Co.	Coraopolis	1,400	Wax	500	Dubbs
Independent Refining Co.	Oil City	1,400	Wax	385	Snodgrass
The Island Petroleum Co.	Neville Island	500	Wax	250	Snodgrass
Kendall Refining Company	Bradford	1,400	Wax	1,000	Dubbs
Mutual Refining Company	Warren	500	S. & L.	200	Snodgrass-Conerty
Pennzoil Company	Oil City	4,000	Wax	3,000	Fleming-Dubbs
Pure Oil Company	Marcus Hook	10,000	Wax	8,000	Cross
Seneca Oil Works	Warren	560	Wax	200	Snodgrass
Sinclair Refining Company	Marcus Hook	16,000	Wax	20,000	Isom
		20,000	S.L. & A	10,000	Cross

Golden Rule Refining Co.	Wichita	1,000	Skim.	1,200	Jenkins
Grant Oil Company	Augusta	2,500	Skim.	1,000	Jenkins
Kanotex Refining Co.	Arkansas City	8,500	Skim.	2,200	Jenkins
Kansas City Refining Co.	Kansas City	7,000	Skim.	1,500	Wellman
Miller Petroleum Company	Humboldt	2,000	Skim.	600	Cross
National Refining Company	Coffeyville	5,500	Comp.	3,000	National
Peerless Oil & Refining Co.	Chanute	2,200	Skim.	2,200	Jenkins
Roxana Petroleum Corp.	Arkansas City	20,000	Skim.	3,000	Dubbs
Sinclair Refining Company	Kansas City	7,500	S. & L.	10,000	Isom
Sinclair Refining Company	Coffeyville	8,500	Comp.	10,000	Isom
Skelly Oil Company	El Dorado	15,000	Skim.	10,000	Cross-Jenkins
Standard Oil Co. (Kansas)	Neodesha	12,000	S. & L.	10,000	Burton
Vickers Petroleum Co.	Potwin	3,000	Skim.	1,200	Dubbs
White Eagle Oil & Rfng. Co.	Augusta	6,500	Skim.	2,500	Burton
KENTUCKY—		**18,500**		**8,700**	
Ashland Refining Company	Leach	3,000	Skim.	1,200	Dubbs
Louisa Co. of Kentucky, Inc.	Louisville	3,000	Skim.	400	Fleming
Louisville Pet. Rfng. Corp.	Louisville	2,500	Skim.	2,100	Dubbs
The Petroleum Rfng. Co.	Latonia	3,000	Skim.	1,000	Cross
Standard Oil Company (Ky.)	Louisville	3,000	Skim.	3,000	Burton
The Texas Company	Pryso	4,000	Skim.	1,000	Holmes-Manley
MONTANA—		**2,600**		**800**	
Arro Oil & Refining Co.	W. Lewistown	2,600	Skim.	800	Dubbs
GEORGIA—		**4,500**		**665**	
Atlantic Refining Company	Brunswick	4,500	Comp.	665	Lewis
LOUISIANA—		**148,000**		**59,800**	
Crystal Oil Refining Corp.	Cedar Grove	7,500	Skim.	2,000	Jenkins
Great Southern P. & R. Co.	Ardia	500	Skim.	500	Own.
Louisiana Oil Refining Corp. Three Plants	Bossier City	20,000	S. & A.	14,000	Tube-Tank
New Orleans Rfng. Co., Inc.	Norco	20,000	S. & A.	1,800	Dubbs
Shreveport Producing & Refining Corporation	Jewella	5,000	Skim.	1,500	Dubbs-Jenkins
Standard Oil Company (La.)	Baton Rouge	70,000	Comp.	40,000	Burton-Tube-Tank
MARYLAND—		**46,000**		**43,200**	
Interocean Oil Co. of Del.	Baltimore	7,000	S. & L.	2,000	Leamon-Dubbs
Prudential Oil Corporation	Fairfield	7,000	Comp.	2,000	Dubbs
Standard Oil Co. (N. J.)	Baltimore	32,000	Comp.	39,200	Burton-Tube-Tank
MASSACHUSETTS—		**22,500**		**3,800**	
Beacon Oil Company	Everett	15,000	S. & A.	1,300	Tube-Tank
Cities Service Refining Co.	E. Braintree	7,500	Wax	2,500	Holmes-Manley
MISSOURI—		**15,500**		**64,600**	
Standard Oil Co. (Ind.)	Sugar Creek	12,000	Comp.	15,000	Burton-Holmes-Manley
Wilhoit Refining Company	Joplin	1,500	Skim.	1,000	Jenkins
Interstate Ref's., Inc. (S.D.)	Kansas City	2,000	S. & L.	500	Muehl
NEW JERSEY—		**241,000**		**139,900**	
Barber Asphalt Company	Mamer	4,000	Comp.	2,000	Cross
Standard Oil Co. (N. J.)	Bayonne, Etc.	180,000	Comp.	112,900	Tube-Tank-Burton
Tide Water Oil Company	Bayonne	36,000	Comp.	12,000	Tube-Tank-Burton
Vacuum Oil Company	Paulsboro	15,000	Comp.	11,500	Tube-Tank-Flemming Cross
Warner-Quinlan Company	Warners	6,000	Comp.	1,500	Dubbs
NEW YORK—		**30,000**		**12,000**	
Standard Oil Co., (N. Y.)	Brooklyn & L. I. City	23,000	Comp.	8,000	Burton-Cross
Vacuum Oil Company	Olean	7,000	Comp.	4,000	Tube & Tank-Cross
Pure Oil Company	Marcus Hook	10,000	Wax	8,000	Fleming-Dubbs Cross
Seneca Oil Works	Warren	560	Wax	200	Snodgrass
Sinclair Refining Company	Marcus Hook	16,000	Wax	20,000	Isom
Sun Oil Company	Marcus Hook	20,000	S L & A	10,000	Cross
Titusville Oil Works	Titusville	1,000	S. & L.	200	Fleming
Waverly Oil Works Co.	Pittsburgh	800	Wax	1,000	Cross
RHODE ISLAND—		**10 000**		**6,700**	
Standard Oil Co. (N. Y.)	E. Providence	10,000	S. & A.	6,700	Cross
SOUTH CAROLINA—					
Standard Oil Co. (N. J.)	Charleston	15,000	S. & A.	28,855	Burton-Tube-Tanks
TEXAS—		**309,000**		**289 500**	
Amarillo Refining Company	Amarillo	6,000	Skim.	3,000	Rousey
American Refining Co.	Wichita Falls	5,000	Skim.	5,000	Dubbs-Cross
Continental Oil Co. of Tex.	Wichita Falls	3,250	Skim.	2,400	Dubbs
Crown Central Pet. Corp.	Houston	5,000	L. & C.	5,000	Holmes-Manley
Empire Refineries	Gainesville	6,000	Skim.	4,000	Doherty-Dubbs
Crystal Pet. & Refining Co.	Burkburnett	750			
Galena-Signal Oil Co. (Tex)	Galena	10,000	S. & L.	4,000	Burton-Tube-Tanks
Grayburg Oil Company	San Antonio	2,500	Skim.	2,400	Dubbs
Gulf Refining Company	Fort Worth	5,000	Skim.	6,000	Gulf McAfee
Gulf Refining Company	Port Arthur	125,000	Comp.	70,000	Gulf McAfee
Humble Oil & Refining Co.	Burkburnett	4,000	Skim.	1,000	Tube-Tank
Humble Oil & Refining Co.	Baytown	50,000	S. & L.	34,000	Tube-Tank
Elliott Jones & Company	San Antonio	4,000	S. & L.	1,500	Holmes-Manley
Kent-Middleton Rfng. Co.	Angus	4,000	Skim.	750	Richey
Magnolia Petroleum Co.	Beaumont	45,000	Comp.	40,000	Burton-Cross
Miller Petroleum Company	Wichita Falls	3,000	Skim.	600	Cross
Oriental Oil Company	Dallas	4,500	Skim.	500	Floyd
Panhandle Refining Co.	Wichita Falls	4,000	Skim.	1,500	Dubbs
Pure Oil Company	Smiths Bluff	20,000	Skim.	13,000	Cross
Simms Oil Company	W. Dallas	4,500	Skim.	3.200	Cross
Sinclair Refining Company	Sinco	21,000	S. & L.	2,000	Isom
Southern Refining Co.	Somerset	2,000	S. & L.	300	Fleming
Star Rfng. & Producing Co.	Fort Worth	1,500	Skim.	200	Fleming
Terminal Oil & Rfng. Co.	Texas City	10,000	Skim.	1,500	Jenkins
The Texas Company	Port Arthur	45,000	Comp.	70.200	Holmes-
The Texas Company	Dallas	15,000	Comp.	13,600	Manley
Transcontinental Oil Co.	Fort Worth	5,000	Wax	1.250	Slagter
Texas Pacific Coal & Oil Co	Fort Worth	3,000	S L & C	1,000	Cross
White Eagle O. & R. Co.	Fort Worth	5,000	Skim.	1,600	Holmes-Manley
UTAH—		**4,500**		**5,000**	
Utah Oil Refining Company	Salt Lake City	4,500	Wax	5,000	Burton-Holmes-Manley
WEST VIRGINIA—		**5,000**		**7 825**	
Ohio Valley Refining Co.	St. Marys	1,000	Wax	300	Snodgrass
Standard Oil Co. (N. J.)	Parkersburg	4,000	Wax	7,525	Burton-Tube-Tanks
WYOMING—		**93 500**		**68.900**	
Continental Oil Company	Glenrock	10,000	Skim.	3,400	Burton
Midwest Refining Company	Greybull	8,000	S. & A.	11,000	Burton
Midwest Refining Company	Laramie	3,500	Skim.	4,500	Burton
Midwest Refining Company	Casper	50,000	Comp.	30,000	Burton
Producers & Refiners Corp.	Parce	12,000	S. & L.	5,000	Dubbs
The Texas Company	Casper	6,000	Skim	7.800	Holmes-Manley
United States O. & R. Co.	Osage	1,000	Skim.	1,000	Cross
White Eagle Oil & Rfng.	Casper	3,000	Skim.	2,200	Holmes-Manley-Jenkins

understood that the Union Oil Company contemplates enlargement of its Cross cracking facilities during the year.

The present status of cracking operations for all states is shown in the accompanying table No. 1.

The estimated capacity of cracking units as given in Table 1 and in the following list of individual companies and refineries operating such units, is not interpreted as the through-put of fresh charging stock. In their reports the operators include in their statement of capacity both the fresh charging stock going into the unit and the recycle of recharging stock derived from previous operation of the unit. In consideration of capacity it is also true that market conditions as well as type of cracking process and quality of charging stock contribute to the manner under which the cracking unit is operated. Under some conditions the operators of units will, on the other hand, run their units entirely upon fresh charging stock, eliminating the re-cracking of recycle or recharging materials—this happens under certain price conditions. Other conditions of price influence the refiner to operate his units to the end that all available gasoline may be recovered—which is conducive to more downtime for cleaning out. This also determines the factor of capacity. The older cracking units in operation usually require more repair, and this factor ofen prevents capacity operation. Insufficient charging stock, unsatisfactory market conditions, etc., are all factors having to do with both the capacity operation of the units and with the ultimate recovery of gasoline through their operation. For these reasons the capacity as rated for both individual operations and for states can not be arbitrarily stated, but must be termed as estimates.

In Table 2 is listed, as far as is available, all of the individual companies operating all types of cracking units, with the rated capacity of both the refinery and the cracking unit—the list covering the entire United States.

Chemistry Puts Petroleum to Forefront in Industry

RICHMOND, VA. — America is leading the world's thought and practice in petroleum chemistry, which has become the most significant field of modern chemical science, it was declared by scientists attending the seventy-third annual meeting of the American Chemical Society held in Richmond, April 11, 12, 13 and 14.

While, it is asserted, the United States is the richest of the nations in natural petroleum, all that it did with this resource, until a comparatively short time ago, was to burn it.

Now, the chemists say, all is changed. Petroleum has become a new, and essentially American, force in the fashioning of civilization through science, succeeding coal tar, fostered by Germany, as the major vehicle of a scientfic advance.

American scientists are developing the chemistry of petroleum, acetylene and related compounds to form the basis of immense national industries and in this way are adding hugely to the national wealth.

Natural gas, a great factor in the wealth of West Virginia and other regions, was said to be the basis of chemical developments promising untold gains in social and financial income.

The chemical utilization of natural gasoline in the manufacture by chemical processes of invaluable solvents for lacquers, glycols, from which non-freezing dynamites are made, without number, is, it is pointed out, contributing largely to the riches of this industrial region, whose potentialities are now for the first time being realized.

In a report to the division of dye chemistry of the American Chemical Society, G. O. Curme, Jr., and J. G. Davidson, chemists, of New York City, called olefine derivatives a new influence in synthetic organic chemistry.

The report told of the existence of a commercial source of new aliphatic organic chemical which, they said, promises to be a great factor in future developments in dyestuff chemistry, petroleum being the source of the aliphatic compounds.

"In previous times," the report said, "the existence of supplies of, first, benzol and coal tar aromatics, later methyl alcohol and wood products chemicals, and more recently acetylene derivatives, have profoundly influenced the trend of dyestuff chemistry."

Now, the report said, it is the turn of the olefine derivatives. The report described the products and the type of reactions to which this development is suited.

Not only has petroleum displaced coal tar as the central theater of chemical effort, but it has enabled America to displace Germany in chemistry pioneering. Rapid progress, both scientifically and industrially, is being made, according to reports submitted to the division of dye chemistry. A notable increase in production and a widening of the range of products manufactured was reported.

Dye stuffs are becoming important agents of medicine, a report by R. W. French, of Newport, Delaware, said. Synthetic dyestuffs, Mr. French added, are playing a leading role as aids to diagnosis, while certain colors are showing promise as therapeutic agents.

"The study of body fluids, tissues and bacteria is only possible, in most instances, through the practical application of coal tar dyes," Mr. French continued.

"This science has developed more or less parallel with the development of the synthetic dye production, with the exception that the microscopist has in general lagged behind the synthetic chemist.

"Today the majority of microscopical stains are accomplished with the earlier known dyes. For instance, methylene blue, eosin, hematoxylin, safranin, funshisne and crystal violet remain as fundamental scientific dyes. Dyestuffs also have found application as germicidal agents."

Automobile owners have no cause to worry about the diminishing gasoline supply for at least a quarter of a century. Until then, at least, there should be no fretful increase in price. Meantime, science is getting more gasoline from the crude products, and is getting more power, more miles per gallon, out of the refined product.

And, when, there is a dangerous scarcity of petroleum, science will have provided a substitute or substitution.

These are the statements of D. H. Killeffer, associate editor of "Industrial and Engineering Chemistry," secretary of the New York section of the American Chemical Society, and contributor to scientific magazines. He is a graduate of the University of North Carolina.

"None of us has any cause to worry yet," he said, "I'm no geologist, but I know it is difficult to say how much reserve oil we have in this country. It is known that there is enough oil from fields now surveyed to last about ten years at the present rate of consumption. How much more there is undiscovered we cannot say. We also know that there is a lot of oil which may be mined, if you please. Ten years ago they chortled when one mentioned mining for oil. They don't today."

Back in the eighties and early nineties, he said, gasoline first came into use. People were burning kerosene in lamps, and occasionally there were explosions. It became necessary to remove the gasoline from the kerosene to prevent explosions. What was there to do with the gasoline?

There were engines that burned gas. They were put to burning gasoline. The gasoline engines of today do not differ much in detail from the gasoline engines developed then.

Nobody cared how much gasoline he burned in those days. It cost very little. But the popularity of automobiles brought the price up. Men began to think about getting more service out of their dollars invested in fuel. And refiners began to concern themselves with getting more gasoline out of a gallon of petroleum.

At first they got a sixth of a gallon of gasoline from a gallon of petroleum. The cracking process was discovered and developed. Nowadays some of the refiners can get two-thirds of a gallon of gasoline from a gallon of petroleum. Hence there is economy in the manufacture of the fuel.

Catalytic Oil Cracking Process

By ISMAR GINSBERG

THE recent interest that was shown in the manufacture of low boiling oils and other products from coal by hydrogenation was an evidence of the attention that continues to be paid to the oil problem, particularly the gasoline or motor fuel problem. This process, which has been called the Bergin process, is really a type process rather than an individual method. By this we mean that there are quite a few processes which work along the same lines as the Bergin process and which are based on the principle of hydrogenation, that is the introduction of the element hydrogen into the constituents of the oil in order to produce low boiling products. Attention has also been paid to the possibility of splitting or cracking oils by heating them in the liquid state to the boiling point, either at ordinary or high pressures, with or without the presence of catalysts. The reader is referred to the article in Erdoel und Teer, 1926, Nos. 17, 18 and 19. The cracking of oils can also be effected by subjecting the vapors of hydrocarbons to a higher temperature for a certain length of time either at the ordinary or higher pressure. Thus, for example, these vapors can be conducted through tubes that are heated to redness or incandescence, or else the vapors may be first heated and led over brickwork heated to a high temperature. Catalysts may or may not be used in these processes.

In this particular article we are concerned with a description of a process of cracking mineral oil vapors by leading them over heated, activated charcoal or other catalysts. (See Erdoel und Teer, 1926, pages 413 ff). In the process of heating oils in the liquid state to the boiling point in the presence of catalysts, it was found that the portion of the oil, which boiled at a temperature lower than the splitting or cracking temperature, which lay between 300 and 350 degrees C., left the cracking still in the uncracked condition. This pertains to the ingredients of the oil which boiled at temperatures lower than 300 degrees C. more than to any of the others. In this case the process was carried out at atmospheric pressure.

A study of the conditions of this process will indicate that in the first place the temperature was not high enough to effect the cracking of the oil, and in the second place the duration of the time was also insufficient. The volatile hydrocarbons are too quickly removed from the cracking apparatus, so that they have not really had the time to be decomposed. The boiling temperature, which is regulated for a definite oil or hydrocarbon mixture, depends of course, on the boiling temperatures of the various ingredients of the mixture. If there are many hydrocarbons present in the oil that boil below a temperature of 300 degrees C., then the boiling temperature of the oil will be quite low and the result then is that the cracking will be unfavorable. It is of course possible to increase the temperature at which cracking takes place by increasing the existing pressure and this will then result in a greater production of gasoline. But the oil man knows well that it is a difficult and expensive matter to operate apparatus under high pressures. There is also the other disadvantage that the operation of apparatus under high pressure results in the formation of coke which is a serious disadvantage in any cracking process.

Flexibility

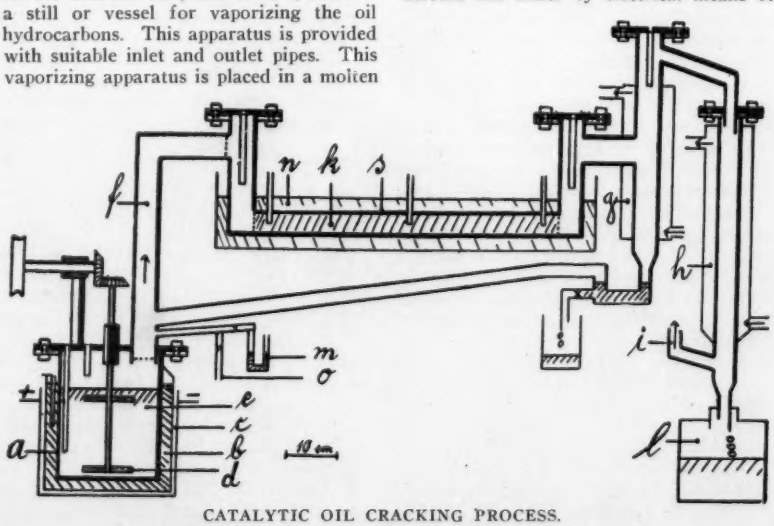
The process which is described in the following is one in which the cracking effect is accomplished on the vapors of the hydrocarbons, and this takes place in the presence of activated charcoal or other catalysts. All sorts of high boiling point substances, such as heavy mineral oils, mineral oil residues, shale oils, tars, ozocerites, and the like, can be treated by this process. It is also possible to use this process for the treatment of oils which boil below a temperature of 300 degrees C. This process can, moreover, be operated at the ordinary pressure. It is also possible to reduce the steam pressure, which means that the cracking can be accomplished in a vacuum. The steam pressure can also be increased to meet the desires and ideas of the operator who uses this process for the production of cracked gasoline.

The apparatus that is used for cracking the heavy petroleum hydrocarbons is shown in the accompanying illustration. At the extreme left, that is at a, there is a still or vessel for vaporizing the oil hydrocarbons. This apparatus is provided with suitable inlet and outlet pipes. This vaporizing apparatus is placed in a molten metal bath b, which has for its purpose the prevention of local overheating of the oil, a result of the better distribution of heat that is gained by this practice. The metal bath is itself heated either by electrical means at c, or by means of fuel gas. The apparatus is also constructed in such a manner that every care is taken to secure good heat insulation. The agitator d serves to keep the oil in agitation during the process and constant agitation of the oil removes the danger that any portion of it will be locally overheated and shot out of the apparatus due to heating over the boiling temperature before actual boiling takes place. The mineral oil that is to be subjected to cracking is indicated at e. The cylindrical vapor header is seen at f, and a number of screens are arranged in this vertical pipe for the purpose of voiding any danger of explosion due to the admixture of the vapors with air.

A manometer m and a small pipe controlled by a valve o, are connected to the vapor pipe. The latter small connection is for the purpose of admitting inert gases or steam into the cracking apparatus. It is furthermore evident that the inert gases or superheated steam can also be admitted directly into the oily liquid itself. The cracking apparatus proper is indicated at s. This consists of a tube in which the catalyst k is located, this being placed between perforated plates.

Regulation

The cracking tube is also placed in a molten metallic bath n, and this has again the same purpose, as has been described above, namely, to improve the distribution of the heat and to avoid local overheating of the oil. The heating is again carried out either by electrical means or



CATALYTIC OIL CRACKING PROCESS.

by means of a heating gas, and it is an easy matter to regulate the temperature of the metallic bath between 300 and 800 degrees C. At g is seen a reflux condenser or dephlegmator, which is either air or water cooled and is provided with a sample-taking valve. This condenser serves to cause the higher boiling fractions of the oil to condense and drop back again into the boiling apparatus a. The distillate cooler is located at h, and i is the outlet pipe for the waste gases, while I is the cooled collecting vessel which holds the final distillate. Metallic wells are provided at different points in the apparatus for the purpose of inserting thermometers and making temperature readings. It is very important to know the exact temperatures at different parts of the cracking equipment, and it is best to use recording instruments so that the temperatures at any time in the progress can be told by referring to the temperature charts.

An experiment was made to test out the suitability of this apparatus for cracking heavy hydrocarbons. A gas oil was selected for this purpose. This product had a specific gravity of 0.900; it contains paraffin but no asphaltic substances, and gave the following results when subjected to an Engler distillation test.

Engler distillation test of the gas oil:

Temperature degrees C.	Percent by volume
Beginning at 300	0
to 310	3
320	8
330	15
340	25
350	39
360	68
362	80
390	100

It is thus seen that the gas oil does not contain any ingredients that boil at temperatures lower than 300 degrees C., and hence all the cracking products, which are formed during the process and which boil below a temperature of 300 degrees C., are newly formed during the cracking operations.

The test was made with five kilograms of the gas oil. The catalyst was about 560 grams or approximately two liters of activated charcoal, as made by the firm of Bayer & Co., Leverkunsen, Germany. The diameter of the cracking tube s was five centimeters and the effective length was approximately 200 centimeters. In order to obtain better transmission of heat it is possible to arrange two or more tubes of still smaller diameter, that is approximately two to three centimeters, parallel to one another. It is also advisable at times to use tubes with a circular, ring-shaped cross-section. It is always possible to connect more than one tube in series in order to increase the actual effective cracking area. The heating of the apparatus takes about one hour, and the duration of the distillation is approximately 24 hours without interruption. The speed of distillation was approximately two and one-half cubic centimeters per minute. The temperature of the liquid in the distilling bottle was varied from 300 to 376 degrees C. during the experiment. The temperature of the metallic bath n and of the actual cracking apparatus ran between 330 and 600 degrees C. The temperature of the catalyst k amounted to 320 to 500 degrees C. The pressure was atmospheric.

Results

In all about three and one-half kilograms of gas oil, which represent 70 per cent of the contents of the boiling vessel, were vaporized and passed through the cracking apparatus. Then the process was stopped. It is of course possible to distill the gas oil in a continuous process without any interruption. The results obtained in this experiment and given below are based on three and one-half kilograms of gas oil put through the apparatus. The total distillate amounted to 2922 grams or 83.5 per cent of the total volume of gas oil and the waste gases and loss amounted to 578 grams or 16.5 per cent.

The total distillate was then fractionated and gave the following results:

	Yield Percent composition of distillate	figured on 3500 grams of gas oil
1. Light benzine from 45 to 150 degrees C., boiling point	20.8	17.3
2. Heavy benzine from 150 to 210 degrees C., boiling point	13.6	11.3
3. Petroleum from 210 to 300 degrees C. boiling point....	26.1	21.9
4. Residue, gas oil, boiling over 300 degrees C.....	39.5	33.0
Total	100.0	83.5

The total yield of the first three constituents amounted to 50.5 per cent. In general the distillate contained approximately one-third ingredients which boil above a temperature of 300 degrees C. In order to reduce this high boiling portion, the dephlegmator, which returns the high boiling fractions back to the distilling vessel, must be made to function more effectively. When the length of the cracking path is increased, this has the same effect. If the thirty-three per cent high boiling fraction is returned to the cracking apparatus, then it is possible to obtain the following yields from this oil:

	Per Cent
1. Light benzine, boiling up to 150 degrees C.	5.7
2. Heavy benzine, boiling from 150 to 210 degrees C.	3.73
3. Petroleum, boiling between 210 and 300 degrees C.	7.23
4. Residue, gas oil, boiling over 300 degrees C.	10.9
5. Gases and loss	5.44
Total	33

It is also possible to return the residue shown in the above tabulation to the cracking apparatus and crack this over again. The total yield of low boiling hydrocarbons, which is finally obtained in this cracking process, is 67.16 per cent.

The gasoline output is very good. The composition of the low boiling fractions is of course dependent on the temperature at which the cracking apparatus is operated and this can be readily changed and maintained at any point between 300 and 700 degrees C. The cracking results are also intimately related with the pressure of steam used and on the time of the cracking. The cross-sectional area and the length of the cracking tubes are also of considerable importance in varying the yield and composition of cracked products. When the temperature is increased, the yield of gasoline is also increased, and the increase in the steam pressure also has a similar effect. But is must be remembered that when the temperature is increased, the yield of waste gases is also increased, a condition which is quite common in cracking processes.

While the catalyst in the process is activated charcoal, it is also possible to employ others, such as basic, acid and neutral or metallic substances. The reader is referred to the article in Teer und Erdoel, 1926, pages 411-3 which has been drawn upon freely in preparing this article.

Refining Company Elects Officers

Robinson, Ill.—The annual meeting of the Lincoln Oil Refining Company was held at the general offices of the company, April 7, at which time the following officers were elected for the coming year:

J. K. Kerr, president; H. B. Carpenter, vice president; W. B. Filson, secretary; F. A. Billstone, treasurer; H. L. Deming, manager; N. T. Stover, sales manager; R. E. Luton, general superintendent.

Directors elected were: J. K. Kerr, H. B. Carpenter, C. C. Carroll, C. L. Fleming, F. A. Billstone, H. L. Deming, N. T. Stover.

The new plant of the company, which has been under construction, is now fully completed, all the units now being in operation. This, in addition to the old plant, gives the Lincoln Oil Refining Company one of the most modern refining units in the country.

Lone Star Gas Company Builds Gasoline Plant

Dallas, Texas.—Lone Star Gas Company is moving in materials to erect a high pressure absorption gasoline plant to be erected near Hollis, Oklahoma, to strip natural gas handled by the company's 18-inch line extending from the Shamrock field, Texas Panhandle district, to North Texas cities. The gasoline plant will be built to handle about 30,000,000 cubic feet of gas daily, using a working pressure of about 400 pounds. The natural gas to be handled by this plant will be very lean in gasoline content due to most of the production coming from dry gassers owned by the company.

Conservation of Water and Heat Exchange in Refineries

By H. H. GREENE
Kendall Refining Company

MORE than five thousand years ago the Egyptians cooled their drinking water by placing it in unglazed earthenware vessels and then exposing the latter to the desert air. Such a container being slightly porous, permitted a small portion of the contents to seep through to the outer wall and evaporate into the hot desert air. In evaporating, the film of water which penetrated to the external surface, abstracted from the water within the container and from the vessel itself, the heat necessary for vaporization. In this manner the water within was slowly but surely cooled to a temperature now determined by means of the wet-bulb thermometer as being from 20 to 50 degrees below the dry-bulb or apparent temperature of the desert air.

The wet-bulb temperature is the point at which the rate of exchange of latent heat from the water to the air exactly balances the absorption of sensible heat by the water from the air.

To cool larger quantities of water, the Egyptians used large shallow and open stone basins. Here again the main body of water was cooled by the evaporation of a small portion from its surface.

And thus for centuries the art of cooling water rested until the advent of the steam engine made necessary an efficient means of cooling water quickly as well as in large quantities. As might be expected large open ponds were used at first but owing to their wastefulness of valuable ground space and their inability to dissipate heat rapidly, they were soon abandoned in favor of the spray pond. The development of the spray nozzle permitted a somewhat higher rate of heat dissipation and because of the spray pond's apparent low first cost proved to be quite popular for a time. However, with mounting land values it was soon found that these spray ponds could not be installed as quickly and cheaply as supposed, also they were not as efficient and effective as modern industrial cooling and condenser practice demanded.

The spray pond in addition to occupying considerable and valuable ground space adjacent to the plant, emitted hot, humid vapors which frequently were wafted or blown against and even into nearby buildings making working conditions exceedingly disagreeable and in many instances unbearable. Also it was soon learned that a considerable quantity of the water being sprayed was carried beyond the pond by the varied and conflicting air currents. Aside from the monetary loss thus occasioned by the waste of water, this condition constituted a continual nuisance and was a decided menace to life and property, especially so in the winter, when the water froze as quickly as it fell.

Towers Come In

These objectionable features were partially overcome through the use of louver fences designed to keep the water within the pond. Furthermore, it was soon found that although accomplishing the purpose for which intended, the louvers were quite as efficient in preventing the desired circulation of air across the surface of the pond. Consequently use of the louvers was more or less abandoned.

The inherent weaknesses of the spray pond soon led to the design and improvement of the so called cooling tower. Originally the towers consisted of timber framework supporting the shell which was filled with brushwood, horizontal slats, tile and other hodge podge devices intended to catch and retard the water on its passage from above. The bottom of the shell was left open so that air might freely circluate by natural draft. Later fans were, in many cases, provided to give increased circulation.

Out of the last mentioned design has emerged the modern industrial water cooling tower, scientifically designed as it is on the drop-and-film principle and fitted with the required number of many bladed motor driven fans often 10 feet or more in diameter. As may be readily understood the modern cooling tower occupies but little ground space as compared with the important work it performs.

The rate of heat exchange between water and air, under the conditions

*Read before annual meeting of the National Petroleum Association, Cambridge Springs, Pa., April 29, 1927.

National Petroleum Association Plans Anniversary Meeting in Fall

Cambridge Springs, Penna.—One of the moves of the National Petroleum Association at its spring meeting here April 28 and 29, was to set in motion the machinery for the annual fall meeting, which will mark the twenty-fifth anniversary of the organization. The spring meeting was devoted to the consideration of technical questions and other phases of the business of the refining industry of the eastern States.

Committees were appointed to make preparations for the anniversary meeting, which will be held in Atlantic City, September 14, 15 and 16. Chairmen of these are H. G. Easton, history; Howard H. Greene, attendance and publicity; Otto Koch, finance; S. P. Worthington, banquet and entertainment; P. S. Tarbox, program.

The importance of examining all provisions of an insurance policy was stressed by Houston Dunn, secretary and treasurer of the National Petroleum Fire Insurance Company, whose subject was "Do You Make Contracts."

Standards and tests were discussed by Dr. H. C. Dickinson, chief of the heat and power division of the Bureau of Standards.

A paper on "Standardization of Cylinder Stocks," by J. B. Fisher of the Kendall Refining Company was read by H. H. Greene of that company. The opinion expressed was that a standard test should be adopted first.

After considering the proposal that a system be put in effect whereby statistics could be provided showing stocks at refineries in the territory, the chairman was authorized to name a committee to investigate possibilities of the system.

H. A. Ross gave a report on the findings of himself and staff in regard to combustion under stills. He told of finding many inefficient installations.

The benefits of a cooperative effort toward fire prevention were outlined by James H. Herbert, president of the Fire Marshals Association.

Improvements in refining practice in the past year were outlined by B. B. Stroud. The introduction of gas recovery plants and the adoption of contact clay filtering were set out as outstanding. Refiners of the Eastern States spent $3,000,000 in improvements last year, according to his report.

Traffic matters were considered at a special conference on the subject. Willis Crane, traffic attorney, outlined the position of Eastern refiners in regard to gasoline rates from the west.

normally found in the modern cooling tower is in direct proportion to the difference between the vapor tension corresponding to the temperature of the water and the vapor tension of the air. Therefore the total amount of heat exchanged in the tower depends upon the difference existing between the vapor tension of the air entering the tower and that of the air leaving the tower. Hence the amount of air required to cool a given quantity of water can be readily determined if the initial temperature of the water, the cooling range and the conditions of the ingoing air are known.

In browsing through a popular handbook of the petroleum industry recently, I ran across the following definition of Heat Exchange: "Heat Exchange is commonly known as a system of heating oil, water or gas by absorbing the heat from some medium that must be cooled." Reading farther I was confronted with this statement, "The distillation process such as used in oil refinery practice offers unusually good opportunities for the use of heat exchange equipment."

Let me say right here that a great deal of refinery condenser and heat exchanger practice is still carried out by "cut and try" methods, but this condition is being steadily remedied and the very crude methods of heat recovery are rapidly being replaced by more efficient apparatus which has proven so successful in those refineries that have realized the importance of heat conservation.

In this day of keen competition, of price cutting and of demoralized markets, it is of tremendous importance to the refiner that he give the matter of conservation his closest scrutiny and application. I reiterate my earlier statement that nowhere does heat exchange equipment lend itself so admirably to substantial economies as in an oil refinery. Do not misunderstand me! In the distillation of petroleum there are other pieces of equipment which are just as much heat exchangers as a liquid to liquid heat exchanger or a vapor to liquid heat exchanger. For instance the old shell still or the modern pipe still are both heat exchangers from the gases of combustion to oil through the shell of the still or the pipes in the pipe still. However, as proven recently by one of the member companies, it may amount to the difference between 34 pounds of coal to the barrel of oil charged to the old batch still as compared with 12 pounds of coal to the barrel of oil run through a modern pipe still, not to say anything about the improvement in the quality of the finished oil. This huge and intricate industrial battle in which we are engaged must eventually gravitate to the end of the survival of the fittest. No one concern has a monopoly on all the best brains. Conditions within the industry today are but a clarion call to those who have vision and will act.

More practical progress has been made in heat conservation during the past quarter century than any other branch of power economies. Most of this work has been directly due to the efforts of engineers in power plants and oil refineries. Many power plant men consider that refinery practice still lacks "refinement" in the matter of heat conservation and point to practices in refinery work which they would consider criminal waste.

It is perhaps true that fewer heat units are wasted in power plant work than in refinery practice. But this is largely due to the multitudinous difficulties faced by the refinery engineer.

Better Fuel Use

The power plant man knows the constants of steam exactly. His use of steam is bounded by narrow limits. The refinery engineer has wider and more inexact uses for heat, and to this difficulty is added his dealing with vapors of varying latent heats under conditions which are constantly changing.

Even under these conditions the best refinery practice is closely approaching power house efficiency in the matter of possible heat conservation. Refineries are today operating on a small fraction of the fuel once used in the older wasteful processes. The rapid strides of the past few months in refinery heat conservation augurs fair to make the next two or three years tremendously important in heat exchange development.

Those of you who were fortunate enough to take the inspection trip on April 8 through the modern Petty Island plant of the Crew-Levick Company know what I mean. There, I am told, they have a modern continuous battery of stills with efficient heat exchange equipment and all on a plot of ground many times smaller than that required by a battery of old type batch stills. Also, and here is the most important thing to my mind, the only place water is used on the entire battery was in a small condenser on the gasoline stream. All other overhead cuts are condensed by the use of the incoming charging stock through the proper utilization of heat exchange equipment.

In many of the older refineries it is a pertinent question to ask whether or not it is desirable to add modern heat exchanger equipment to an inefficient still battery or to build an entirely new unit using the modern pipe still as the primary source of heat and with efficient heat exchangers mounted closely together to minimize heat losses and permit the use of automatic control to a large extent. Often the old battery with some minor changes and additions can be revamped with comparatively small expense to secure the desired results.

Economic Range

In a treatise of this kind it is obviously impractical to cite actual examples of economies effected through the utilization of heat exchange equipment unless every condition is given. The work that an exchanger is required to perform is directly related to the type of charging stock, fractionation, type and number of stills, liquid surface, bottoms and other variables which makes it readily apparent that before possible economies can be determined a careful survey must be made. In many instances too, there is a question of gums, sediment or residue adhering to the tubes, which necessarily involves the provision for cleaning facilities if efficiencies of rating are to be maintained.

Refinery engineers are agreed upon there being no real reason why exchanger equipment should not get at least 60 to 70 per cent of the heat from the vapors and residual in petroleum distillation. Ordinarily the average exchanger is most economical when recovering 80 per cent of the available heat. Its capacity is almost directly increased with an increase in the velocity of the fluid. However, the pumping cost increases much faster than the increase made possible in the velocity of the fluid. Hence the reason for the economic range centering around the 80 per cent point.

It is important to keep in mind that the steam used in distillation gives up approximately 950 B. T. U.'s per pound when condensed whereas oil vapors give up around 125 B. T. U.'s. It logically follows that only enough steam should be used in the distillation to secure the results desired. Many of the larger plants have recently capitalized on this fact, coupled with the fact that oil vapors condense at a higher temperature than steam vapors, by placing steam jet thermo-compressors on stills using quantities of steam. This arrangement may be briefly described as follows:

The mixture of steam and oil vapors leaving the still, flows to the condenser where water is used as the condensing medium. The oil vapors condensing first at the higher temperatures permits the steam being withdrawn and supplemented with sufficient live steam to boost the pressure and return to the still. A double saving is thus effected, first there is a substantial saving in live steam used thereby improving the overall economy of the still, and second the reduction in the condenser duty results in a material reduction in quantity of cooling water required.

I state frankly without fear of successful contradiction that the next decade will see even greater application and development in the use of heat exchangers in petroleum refining. If the foregoing will in any way be the means of creating renewed interest in the subject of conservation water and heat exchange in refineries then, the purpose of this treatise will not have been lost.

Natural Gasoline a By Product of Gas Lift at Seminole

By GEORGE REID
Staff Representative

ALTHOUGH the gas lift systems of increasing or maintaining production from oil wells is essentially an innovation and perfection of the oil producing fraternity, the system has become, upon its more intensive application, of much interest to manufacturers of natural gasoline.

The general principle of recycling gas from gasoline plants through the oil sands embraces the forcing of the residue gas from gasoline plants down into the oil sand under pressure, where it drives the oil and gas in the well upward and to the surface. Incidental to its exposure to the oil in recycling systems, the dry gas in turn usually becomes saturated with gasoline because of its contact with the oil, and is returned to the gasoline plant as enriched gas from which the gasoline is again extracted.

While the producer has usually succeeded in increasing his oil production, or in securing this production at less cost per barrel, there has usually occurred an important enrichment in the natural gas produced, often an increased production of gas containing an increased gasoline content. The oil, naturally, suffers a slight reduction in gravity as the usual thing, but this loss is offset by the increase of natural gas, and the greater gasoline yield per thousand cubic feet. In other words, the value of the gas recovered is usually sufficient to offset any decrease in the value of oil produced under the gas lift system.

Probably the most extensive development of the gas lift system ever experienced in the petroleum industry has occurred with the progression of oil production in the Seminole oil field, Oklahoma. The application of the gas lift, the installation of gasoline recovery systems, and the general development of the area is of interest to the natural gasoline industry because of the several unusual factors surrounding its application.

Outside Gas Used

The oil production coming from the Wilcox sand in the Seminole area is accompanied by very little natural gas. This condition contributes to the short "flowing" life of the oil wells, and in turn has been instrumental in the application of the gas lift in the area. Many companies at Seminole are using air under pressure for flowing wells, but as this method has certain disadvantages not encountered in gas lift work, there are several companies that are conducting dry natural gas through pipe lines from other areas for the purpose of flowing wells with gas under pressure. This marks one of the first field developments where the natural gasoline plants operating in outside or distant areas, are called upon to supply dry natural gas to another field to accompilsh economy oil production. In addition to this employment of natural gas, previously stripped of its gasoline elsewhere, there follows the necessity of installing gasoline extraction plants in the Seminole area for extracting gasoline from the gas after it has been through the wells. In this way the gasoline plants at Seminole are manufacturing gasoline from gas produced and subjected to gasoline extraction in other fields, and which is subjected to the process of gasoline extraction the second time and after it has been exposed to enriching conditions in a second oil field. Gas produced in its native area has been recycled repeatedly in several instances and with each recycling has been productive of additional gasoline. Seminole practice, however, is among the first where gas has been utilized in this manner in two separate producing fields.

At present there are several companies that pipe line dry gas into the Seminole area for this purpose. The Barnsdall Corporation, for example, has a six-inch gas line 30 miles long which is employed to carry gas from its well in Okemah, Oklahoma, to the company's producing properties in Earlsboro and Seminole.

The Independent Oil and Gas Company and the Empire Company are among others who have gas lines leading into the field from outlying districts. This "foreign" gas is conducted through compression plants, where it is raised to the pressure required for gas lift work, forced into the oil wells, and upon its return to the surface it is "green" or wet gas. At this stage the gasoline content is usually removed before it again enters the wells flowing under artificial stimulation methods.

Compression Type

Under these conditions there are many producers of crude petroleum who are now manufacturers of natural gasoline, especially in the Seminole field.

In this area the natural gas native to the district has a gasoline content as high as four gallons per thousand cubic feet, and several operating companies

GENERAL VIEW OF CARTER OIL COMPANY'S GASOLINE PLANT, GRISS LEASE AT SEMINOLE.

INTERIOR OF PURE OIL COMPANY'S COMPRESSION PLANT AT SEMINOLE.

which are recycling natural gas through their oil wells with compressor installations have experienced difficulty, especially during the winter, in handling the rich gas through these plants, due to the inadvertent condensation of the gasoline content of the gas. Due to this factor, many of the original gas-lift compression plants erected solely for the purpose of recycling gas through the wells, have been converted into gasoline extraction plants of the compression type.

Thus, the installation of a compression plant, handling gas at pressures ranging from 200 to 300 pounds per square inch, becomes in reality a compression gasoline plant through the simple installation of accumulator tanks where the gasoline condensed when the compressed gas leaves the cooling coils drops out, and is blown to storage through the automatic manipulation of control level regulators. There are many plants of this type in the Seminole district, which are manufacturing compression gasoline from recycled natural gas. The producing operator, who manufactures gasoline under such conditions, as an adjunct to his business of oil production is not vitally interested in the manufacture of gasoline as a profitable source of revenue, but collects the product essentially to keep his lines clear of the fluid. This practice also deters the condensation of water in the gas lines and subsequent freezing in the colder periods of the year.

Combination Plants

Another type of installation which is perhaps peculiar to the Seminole district is the combination air-dry gas, or wet gas, compression plant. These units also owe their development to the intense application of air and gas lift systems to the productive oil areas of the district. Several companies have erected plants which are manifolded in such a manner that the switch from air compression to the handling of natural gas, either "wet" or "dry," is accomplished in a few minutes by the opening and closing of valves on the intake lines of the machines. One large installation provides for switching back and forth from air to gas or the reverse and identifies the valves controlling the gas on the gas intake lines by painting them bright red. The air lines are painted black. When the plant is compressing gas, the gasoline production is accumulated in tanks as it is condensed, and blown to storage tanks for future handling. The same pressures are used when either air or gas is compressed for flowing the wells artificially, but no gasoline is manufactured, naturally, when air is passing through the plant.

This type of plant is installed for the purpose of using air as auxiliary when sufficient gas is not at hand for the flow system operation. Gas, at Seminole, is not plentiful, and as previously stated, some companies are importing it into the field. There is a difference in policy with these manufacturers of natural gasoline in regard to the distribution of the product made. Some simply pump their gasoline to the crude oil storage tanks, which are usually vapor proof, and the gasoline blended with the crude is sold as crude oil. Others collect the product for shipment and load it in tank cars for sale on the open market. One company operating a very productive lease at Seminole, where they produce 25,000 to 30,000 barrels of oil daily, is extracting about one gallon of gasoline for each barrel of oil brought to the surface. This installation, which is essentially a gas lift plant, is therefore manufacturing 25,000 gallons of gasoline daily as an adjunct to its producing business. This gasoline is loaded in tank cars and shipped as compression natural gasoline, weathered to grade.

Unless the volume of natural gas to be imported into the district becomes sufficient to provide a constant supply of dry gas for the lift systems, there will continue to be a change from gas to air compression with a number of plants, depending, of course, upon the length of time that gas is available for any one plant. This condition indicates that there will be periods during which the Seminole area will be productive of much more natural gasoline than it will at other periods. A number of plants, running today may be compressing air, while in a few days these same plants, or a number of them will become manufacturers of natural gasoline due to the fact that they are recycling dry gas, enriching it, and condensing the gasoline from it in the compression plants. Thus the problem of the natural gasoline statistician becomes more involved, as the development of the gas lift progresses. The listing of natural gasoline manufacturing plants now in operation is one of the most difficult of the statistician's problems, but with the advent of a number of combination air-gas compression plants which will no doubt, increase in number as the gas lift systems are installed in the future, at Seminole and in other flush areas yet to be developed, the question of "who's who" in gasoline production will become more involved and confusing.

Plant Equipment

The compression type gasoline plants in operation in the Seminole area are comprised of a great variety of equipment, and consist of virtually all of the well known compressor machines. The compressors are variously set upon bases of concrete, heavy steel beams, and large wooden sills. The machines are variously driven by direct connected gas engines, steam engines, some are belt driven by gas and steam engines, while the installation of compressors belt driven by electric motors are very popular. The Oklahoma Gas & Electric Company has been servicing the fields since the early days of its development, and maintains a large force in the territory for the purpose of supplying uninterrupted electric power to a great number of compression plants.

Scrubber tanks are provided in the usual manner for cleaning the incoming gas as it flows into the compression plant, and again for scrubbing the gas after it has been compressed.

The water sprayed cooling coils are erected in different manners. Some companies place their louvre towers and coils in the usual way, by digging pits and lining them with concrete for the storage of the cooled water. Others erect their cooling coils and lourves over steel tanks, using the topless tank as the storage pond for the circulated water. The latter type of installation is perhaps the more popular method of the two in the Seminole area, and it is employed in conjunction with both the compression type of gasoline plant, and the absorption gasoline units in the field.

Absorption Type

In addition to the numerous compression type plants, which are doing double duty; namely—recycling gas in the artificial flowing of oil wells, and extracting natural gaoline, there are several absorption type gasoline extraction installations. In the operation of these plants, the wet gas after emerging from the oil wells is taken through a portion of the compressor machines and discharged through the absorption plant. The residue gas from this operation is then conducted to other compressors and boosted in pressure sufficient for the gas lift operations. The natural gas production yields a slightly higher recovery of natural gasoline when subjected to this type of circulation and the finished product is a more stable commodity—as is common with gasoline extracted by the absorption method. The installation of stabilizers or rectifiers in conjunction with the compression type plants will be conducive to the production of a more stable product from these installations, but up to the present time the stabilizer has not made its appearance in the territory. Certain companies not wishing to stand the losses concurrent with the weathering of compression gasoline are anticipating the installation of stabilizing equipment in the near future.

The Pure Oil Company was among the first to erect an absorption gasoline plant in the Seminole field proper. The plant is Newton equipment and consists of an installation formerly in operation at Mehan, Oklahoma. The absorption plant is operating on natural gas discharged to it from three Bessemer 175 H. P. compressors, which are a part of 10 such machines installed in one building. The remaining seven machines are employed for the dual purpose of extracting gasoline from recycled natural gas and for the flowing of oil wells by gas lift methods. The natural gas stripped of its gasoline

(Continued on page 66)

Natural Gasoline Plant Problems On Tulsa Program

Third day added to session to permit this feature; associate members to have charge of entertainment features

By GRADY TRIPLETT

TULSA, OKLA.—In order to put a day of consideration of problems in plant operation back on the annual program, the Association of Natural Gasoline Manufacturers has arranged a program of three days, May 24, 25 and 26. All sessions of the meeting will be in the Mayo hotel, Tulsa.

Subjects for the meeting for plant operators will come the second day of the meeting. The first day will be devoted to general subjects. The last day will be devoted largely to motor fuels.

Another departure this year will be the part which association members will take in furnishing entertainment for the convention.

The whole program was not completed at the time of preparing this.

The meeting will open May 24 with an address of welcome by F. L. Chase, vice-president of the association and vice-president of the Lone Star Gas Company of Dallas. Next will come the annual address of the president, E. L. Peck, manager of the natural gasoline department of the Empire Companies, Bartlesville. Reports of committees will be next, followed by the annual report of the scretary-treasurer. The morning session will be completed with the naming of the committee for nominating condidates for officials and directors.

Plant Program

In the afternoon a paper, "Economics of the Natural Gasoline Industry," will be presented by J. C. Chatfield, of the National Petroleum News. Progress of the Research and Education Program will be presented by D. E. Buchanan, chairman of the committee having this work in charge and vice-president of Chestnut & Smith, Inc. Paul D. Barton, president of the California Natural Gaosline Association, will discuss "The California Natural Gasoline Industry."

May 25 will be the day of the program devoted to problems of plant operation. The subject of safety will be presented by Don J. Wallace, director of the Petroleum Safety Council of the Mid-Continent Oil & Gas Association, whose subject will be "The First Law of Nature." S. S. Smith of the Roxana Petroleum Corporation will discuss "Portable Plant Operation." C. L. Swim, manager of the insurance department of the Skelly Oil Company, will discuss "Co-Operation Between Plant and Office."

The afternoon of the second day will bring a paper, "Water Treatment," by F. B. Good of The Texas Company, Breckenridge, Texas. "Fire Prevention as Applied to the Natural Gasoline Industry," will be presented by C. T. Ingalls, manager of the Oklahoma Inspection Bureau. The report of the nominating committee and the election of officials will complete the program of the second day.

Banquet Second Evening

The annual banquet will be held the evening of the second day.

The third day will be devoted to the general subject of Motor Fuel. Dr. G. G. Brown, who has had charge of experimental work for the association for the past year will lead this subject. There will be discussion on this as well as on all other subjects brought before the convention meetings.

Entertainment for the convention this year, other than the annual banquet, will be furnished by associate members of the Association of Natural Gasoline Manufacturers. This will consist of two luncheons and a smoker.

A general meeting May 5 resulted in the naming of committees to work out details and to carry the entertainment through. These committees follow:

Finance—P. P. McKirahan, Continental Tank Car Company, chairman; William Schleuter, Refinery Supply Company and Grady Triplett, The Refiner and Natural Gasoline Manufacturer.

Tickets.—R. H. Owens, Union Draft Car Company, chairman; D. W. McKay, Hope Engineering & Supply Company; O. F. Cozier, National Petroleum News; R. E. Howe, Atlas Supply Company; M. H. Kotzebue, Tulsa, Boiler & Machine Company.

Entertainment. — William G. Cummings, Gas Engineering & Construction Company, chairman; W. C. Brown, Foxboro Company; H. D. Skyrm, Pennsylvania Tank Line; R. E. Day, Magneto Ignition Corporation, and T. C. Andrews, General American Tank Car Corporation.

Banquet.—Charles DeBrunner, North American Car Company, chairman; C. O. Williams, Oil & Gas Journal; Forrest B. Dunlap, Bessemer Gas Engine Company; L. F. Williams, C. & G. Cooper Company, and F. I. Thompson, Westcott & Greis, Inc.

The plan adopted at this meeting was for an assessment against each manufacturer coming into the entertainment program. From this common fund all expense of the entertainment will be paid. Then any money not used will be refunded on a pro rata basis.

While the entertainment originated with associate members of the organization, it was not restricted to these. In working out the plan, one effort was to increase the association membership. Out of each amount given by a non-member, the amount equal to the annual dues of an associate member was given to the Association of Natural Gasoline Manufacturers, thus placing the contributor on the roll of the associate membership.

At noon of the first day of the convention, there will be a luncheon at the Mayo hotel. That night the entertainment will conist of a smoker with vaudeville entertainment in the Crystal ball room of the hotel. The second night will be given over to the annual banquet of the association, with which the special entertainment has no connection. The third day there will be another luncheon.

What the associate members hope to have come out of this effort is a permanent organization of associate members to take care of all entertainment of the annual conventions. The intention is to have this function like the organization of Natural Gas Supply Men in its relation to the Natural Gas Association of America.

Adoption of this type of entertainment grew out of the desire of some manufacturers to get away from entertainment which interfered with the programs of the convention. J. H. Satterwhite of Westcott & Greis, Inc., W. G. Cummings of the Gas Engineering and Construction Company, B. L. Potter of the Bessemer Gas Engine Company, T. F. Hudgins of C. & G. Cooper Company, and T. C. Andrews of the General American Tank Car Corporation met first and made preliminary plans.

Officials of the Association of Natural Gasoline Manufacturers gave approval of the plan to make the entertainment on the part of manufacturers a general affair, involving no conflict with convention programs.

Magneto Trouble Lessened When Method Supplants Guess

By OTTO PETERS

WITH a problem to solve, a method is needed. The test of the method is the result. When the result is favorable, problem, method and result make excellent knowledge for those dealing with similar problems.

In this instance, one type of magneto is presented. But that does not detract from the value of the knowledge. A similar method or an adaptation from it will bring solution to the magneto problem in any natural gasoline plant and on any type of magneto.

This article is offered not to present the case of this one product but to present the more important fact that there is a solution possible when the magneto offers difficulty.

THE study of magnetism is interesting. It is the fundamental principle of operation for electrical devices and knowing how important it is for engineers to understand ignition, the study of magnetism should not be neglected. Without a knowledge of it we can not intelligently repair an electrical device, especially one that is governed by magnetism.

It is imperative that engineers study ignition. While there are different types of magnetos the working principle is practically the same, the difference being in construction. While we are discussing the breaker box of the H. T. K. W. Magneto, I do not question its construction, but in my experience it plays the most important part of bringing about efficient ignition, and where it may be abused, neglected and condemned, I maintain that with proper care the trouble to which it is subject can and will be reduced to troubles that are brought about by natural wear of working parts.

In my capacity of chief engineer I instructed the engineers that I would not accept a report as "Engine Down" on account of ignition trouble. I insisted upon a definite explanation of the cause of trouble and the repair made. On the bulletin board we placed a part list book which had a picture of the breaker box with the parts numbered so that when a breaker box was in trouble the engineer could report what part was affected. We also placed a glass cover on the breaker box which exposed to view its working parts while in operation, and then we compiled the troubles of the breaker box and the engineers eliminated repeated trouble.

The repair part list book and insisting upon a definite explanation of the trouble enabled me to check up on repeated troubles. It benefited the engineers, stimulated their interest and aroused their desire to avoid repeated trouble. It eliminated the usual practice of one engineer making a repair and on the next tour the other engineer making the same repair. As a matter of fact there was something doing if a breaker box showed trouble more than once a month. My remarks on the breaker box are submitted for your consideration.

Breaker Box on the H. T. K. W. Magneto

Screw for breaker arm spring.—The screw for breaker arm spring is not easily accessible and for that reason it may be neglected to be securely tightened. This will in time work out and invariably cause moving arm to stick. The screw by all means should be securely tightened.

Circuit breaker arm. — The circuit breaker arm is caused to stick by rocker arm screw being gummed up with dirt and oil, or side of breaker arm binding on screw head. By cleaning the shoulder of the screw with fine emery cloth it will also bring about more clearance, thus allowing more room for any dirt that may collect which can then be removed by wiping when again cleaning. It is good practice when setting up the screw to back it out one-half turn and then lock it. This will prevent movable arm binding on screw head and no side play of movable arm will take place as the arm spring is held tight by the arm spring screw.

Rocker arm roller.—The rocker arm roller is troublesome in that it sticks and by not revolving it wears a flat surface which in time causes trouble by decreasing gap between contact points. To prevent this make sure it does not bind against side of circuit breaker arm and that it revolves freely on the pin.

Cam.—The cam is sometimes placed wrong. It is stamped with an R on one side and an L on the other side. They stand for direction of rotation, either right or left hand determined by facing drive gear of magneto. There is the possibility of the cam being stamped wrong but that is for you to decide when determining direction of rotation. In time the cam may show natural wear of surface making contact with roller. It rests with your judgment when to change a worn cam, as a worn cam effects opening of contact points.

Contact points. — The adjustment of contact points is important—by all means have them adjusted to thickness of gauge —1/64-inch.

The volume of spark depends to a great extent on the proper break of these points. When the points are too close they do not break clean as the arcing at the points causes the currents to linger in the primary winding of the coil. When the points are too far apart they may not close tight enough to allow current to flow and in addition the opening of the points occurs too early and causes an unnecessary pounding on the roller. You will appreciate that in the adjustment of the points time of movement is a factor. This is evident when we consider piston travel from time set for spark and time actual combustion takes place. My experience has been that when points are too wide apart it causes pre-ignition demonstrated by thumping knock in crank-end of power cylinder. On the other hand, when points are too close I have noticed that the cylinder head gasket started leaking and violent knocking took place in power end of cylinder. In connection with these indications, loose fitting crank-bearings which are apparently OKay while in operation are shown up when the points are too close together. When this happens you would swear something tore loose in the crank-case.

Dirty contact points may cause sparking at the points. A condenser of improper capacity may cause sparking by not being able to absorb the current, but where it is highly improbable that the condenser is not of proper capacity, the only trouble you may have in the condenser is either an open or a short circuit, either one of which cause the magneto not to function, so that the chances are you will have no trouble at the contact points due to the condenser. It is essential that the points come together squarely, this is much neglected, you must exercise your own initiative to bring this about, a good practice is to round off the edges of the point as this will help to prevent pitting of points. Sometimes excessive pitting of points is an indication of condenser trouble. In cleaning the points with a file, use your judgment, do not file points away, just clean them, remember your doing the job. In advancing or retarding the spark keep in mind the distance between edges of gap on the box is approximately 3/8 inches, sometimes it is greater due to improper box or due to wear, if the space is greater than what it should be it will throw rotor out of the magnetic field.

Spark Plug.—The adjustment of spark plug points should not be greater than 1/64-inch, in other words they should be of the same adjustment as the breaker box contact points. If, however, you obtain better results with a closer adjust-

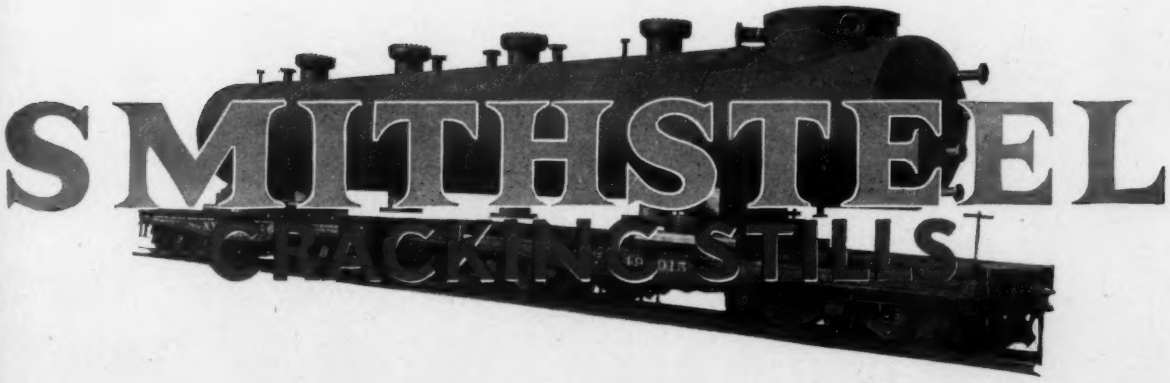
Bigger Units With Greater Capacity

Three times in the last two years the A. O. Smith Corporation has been called upon to build cracking stills exceeding in every dimension anything that had been built before.

Smithsteel Cracking Stills have swept away the old limitations on the size of cracking units.

Complete technical control established over all materials and processes of manufacture, checked and supplemented by exhaustive testing enables the A. O. Smith Corporation to manufacture cracking stills for any cracking process—to any size within transportation limits.

A. O. SMITH CORPORATION - *Milwaukee, Wisconsin*
Oil Field Products Division *Los Angeles*



ment of the plug points, it does not reflect on the efficiency of the plug, that particular engine may require a closer adjusted spark plug point. The elements that make the spark are voltage and amperage, amperage is the amount of current, and voltage is the force that makes the current jump the gap between the points. The current is demonstrated by the spark which is the electricity passing through the air from one point to another, it has to overcome the great resistance of the air and working against this resistance it produces heat shown by a flame or spark. The voltage of the magneto is approximately 20,000 volts, the amperage is one-twelfth ampere. I should think we owe it to ourselves to study this magneto to understand why and how it produces a spark of 1/12 ampere under a pressure of 20,000 volts.

Safety Spark.—In connection with the spark there is a part of the magneto called a Safety Spark Gap. It is in operation when the spark plug fails, due to an open in the circuit from the magneto to the plug or the plug points may be too far apart. Its function is to provide a path for the current that fails to go through the spark plug. If the safety spark gap did not function it would seriously affect the winding of the magneto. The gap is adjusted at the factory and it should not be tampered with unless you know what you are doing and why you are doing it.

Natural Gasoline a By-Product of Gas Lift at Seminole

(Continued from page 62)

through the Newton equipment is then utilized as dry gas for fuel under boilers about the lease and in the operation of gas engines driving compressors.

Studying High Pressures

Because of the better efficiency in gasoline extraction secured by the operation of absorption plant, as against the compression installation, some gasoline engineers in the area are investigating the possibility of employing high pressure absorption plants for the double task of extracting gasoline first, under high pressure to the oil wells for the purpose of flowing them artificially. It is believed by some engineers that the second compression can be eliminated by such practices, and by discharging the residue gas from the high pressure absorption units into a header line, then by the installation of automatic recording volume control instruments at the point where the gas under pressure is distributed to the several individual wells, that this type of plant will operate with more efficiency and economy than the present type of installation. This type of plant may necessarily have to operate under whatever pressure is required to flow the oil wells, and be governed as to pressure by this factor. With the efficiency and elasticity of some of the later deveolped and perfected absorption gasoline plants, such an installation is entirely feasable. The highly scientific absorption plants developed of late years are not so rigid in their requirements of constant unchanging volume loads and pressures and fluctuations of volume and pressure need not be hazardous to efficiency. Some installations of the high pressure absorption type of gasoline extraction operating on their residue or what is termed as "domestic" gas are confronted with varying loads with a wide range in a single day's operation but with their efficiency not materially impaired. Such installations operating in the Seminole field and discharging their residue gas directly into the oil well to be flowed artificially by such stimulation will obviate the necessity of double compressing of the gas, and the single compression of the gas will be sufficient for both process of gasoline extraction and the operation of oil wells under the gas lift system. This is one of the problems being worked out at Seminole by the engineers of the operating companies.

Natural Gasoline Plants Operating in the Seminole District.

Company and Location	Est. Daily Capacity Gallons	Estimated Gasoline Prod'tion Gallons
Amerada Petroleum Corporation—		
Killingsworth plant section 23-9-6	5,000	5,000
School land, section 16-9-5	20,000	16,000
Carter Oil Company—		
Stewart lease, section 34-10-6	40,000	25,000
Cudjo lease, section 35-9-6	12,000	6,000
Grisso lease, section 15-9-6	60,000	35,000
Empire Gasoline Company—		
James lease, section 24-9-6	30,000	30,000
Wilson lease, section 24-9-6	20,000	20,000
Gypsy Oil Company—		
School land, section 16-9-5	37,000	24,000
Independent Oil & Gas Company—		
Tolof-Fixico lease, section 26-9-6	30,000	20,000
Pure Oil Company—		
Strothers lease, section 26-9-6	20,000	20,000
Sinclair Oil & Gas Company—		
Cudjo lease, section 35-9-6	100,000	83 000
Cudjo Booster stn'. section 35-9-6	10,000	10,000
Walker Booster stn'.	10,000	10,000
7 Companies—13 plants	394,000	304,000

Phillips' Panhandle Plant Starts Operating

Amarillo, Texas.—Phillips Petroleum Company will start operating early in May in the first natural gasoline plant to be erected north of the Canadian River in Hutchinson County. This plant is located near the west line of the southeast quarter of section 1, H. & O. B. survey, block X-02, on the G. E. Martin-Perkins land, and will handle about 15,000,000 cubic feet of gas daily. In addition to handling gas production from leases owned by Phillips, the plant will receive gas on contract from Amerada, White Eagle Oil & Refining Company, Marland and the Gulf-Cline-Panhandle Refining Company property. The latter property consists of about 12,000 acres.

Phillips Petroleum Company is reported to be making plans to erect a large natural gasoline plant in the Sanford-Paramount section of Hutchinson County, where considerable new development is taking place in sections 82, 83 and 84, block 46, and a short distance south of the river.

Extend Time on New Rate From Mid-Continent

Tulsa, Oklahoma.—Another month of respite has been granted refiners of Northeastern Oklahoma in their effort to prevent rates of the Interstate Commerce Commission, known as the Western Trunk Line case, from becoming operative. The commission has extended the time for the rates taking effect from May 20 to June 19, due to the efforts of refining concerns, rail officials and the Corporation Commission of Oklahoma.

The proposed rates would give Kansas shippers a differential of two cents under Oklahoma gasoline rates.

In granting another month under the old rates, the commission has left a possibility that the case may be reopened. This is what refiners of the northeastern part of Oklahoma have been seeking. Recently the new tariffs were studied and all errors noted. These were forwarded to Washington each night in the hope of causing the Interstate Commerce Commission to reopen the case.

Should this respite fail to bring a reopening of the case, the next move will be through the courts. Oklahoma refiners have organized and employed counsel for carrying the case into federal court and then to the Supreme Court for a decision.

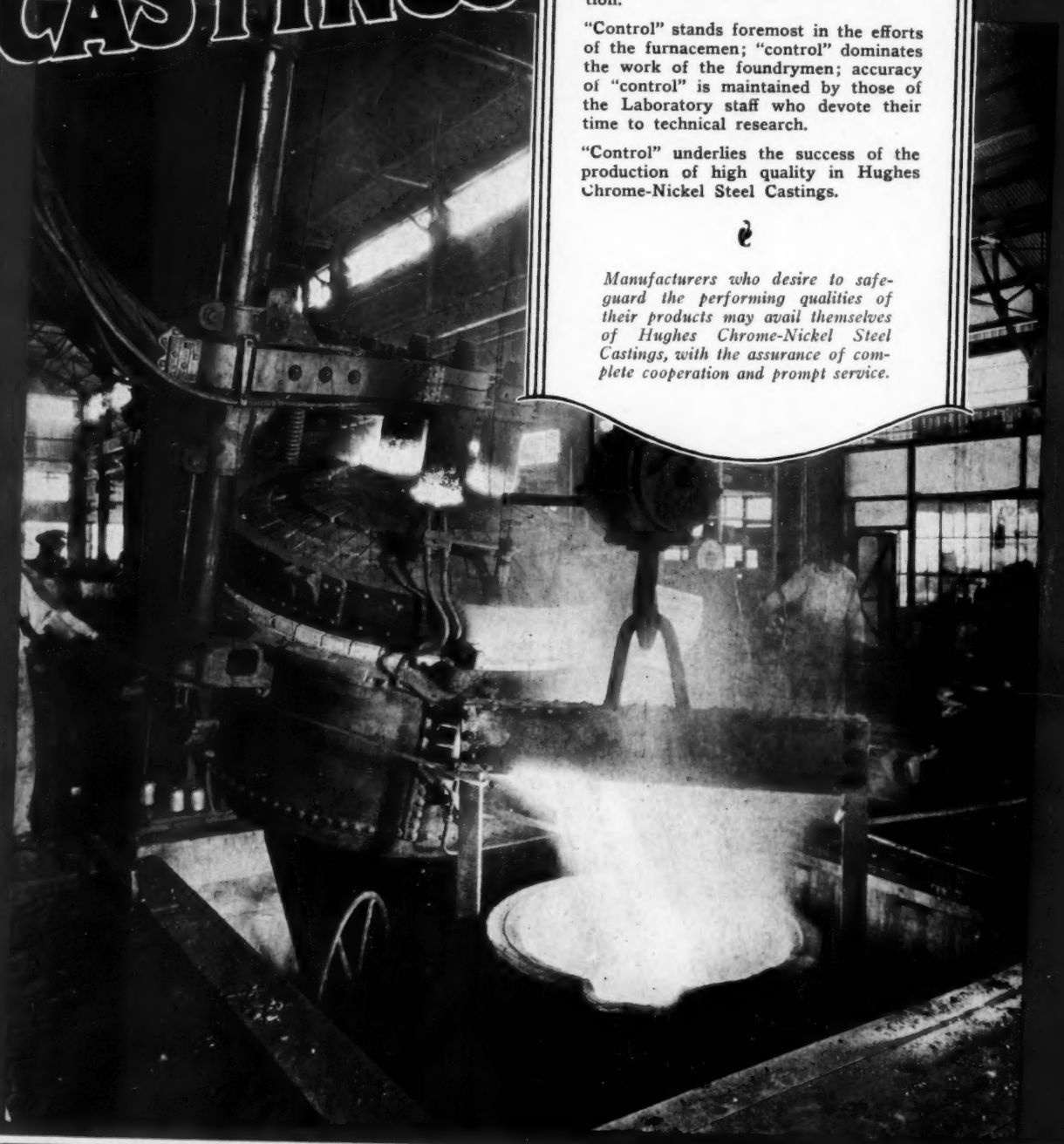
HUGHES CHROME NICKEL STEEL CASTINGS

"Control" is the fundamental element interwoven throughout all the steps in the manufacture of Hughes Chrome-Nickel Steel Castings. It commences when the charge from the 3-ton electric melting furnace is weighed in the scrap yard, and follows through until the finished casting has passed final inspection.

"Control" stands foremost in the efforts of the furnacemen; "control" dominates the work of the foundrymen; accuracy of "control" is maintained by those of the Laboratory staff who devote their time to technical research.

"Control" underlies the success of the production of high quality in Hughes Chrome-Nickel Steel Castings.

Manufacturers who desire to safeguard the performing qualities of their products may avail themselves of Hughes Chrome-Nickel Steel Castings, with the assurance of complete cooperation and prompt service.

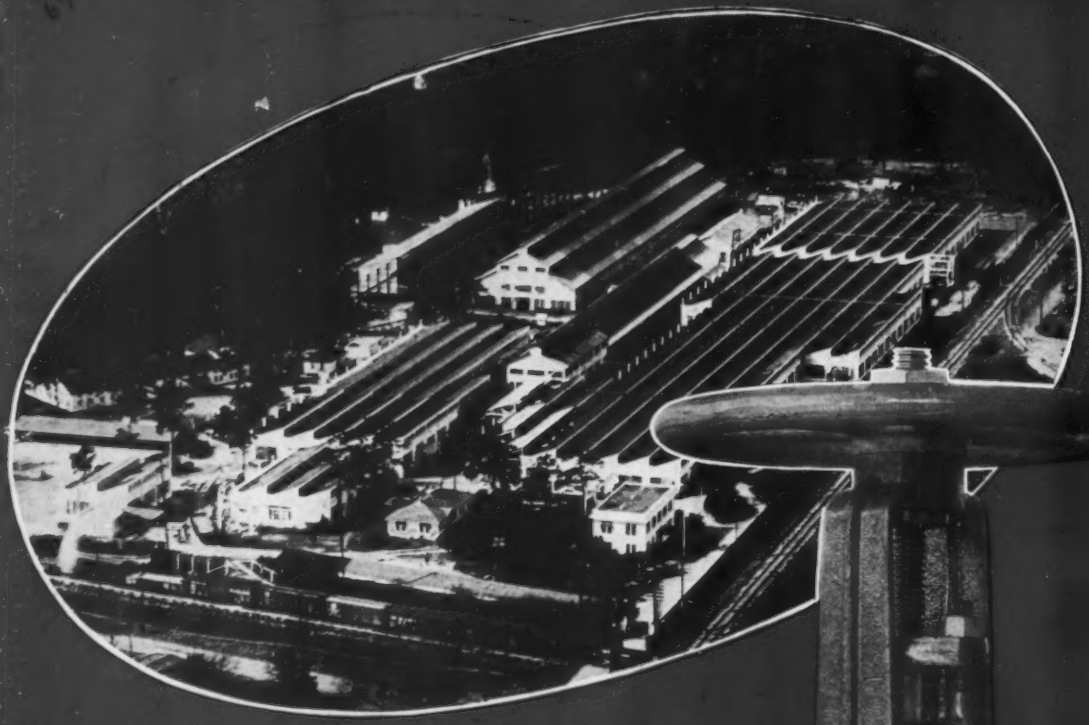


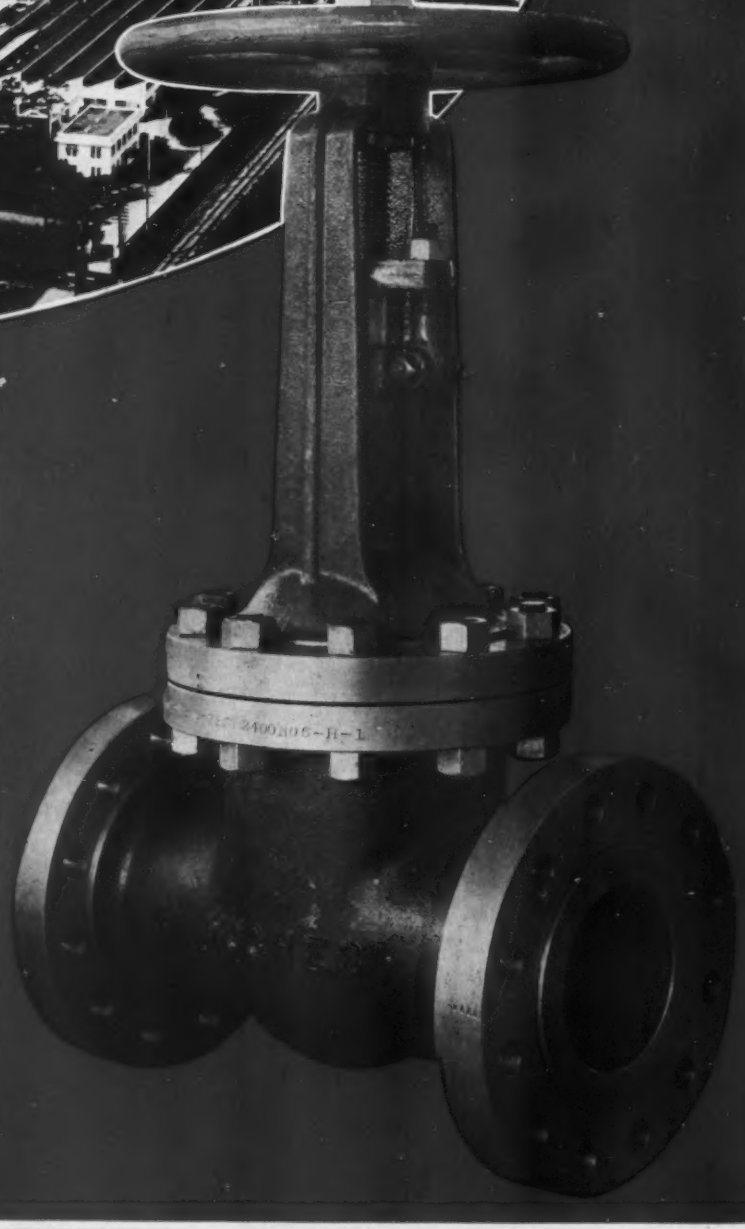
HUGHES TOOL COMPANY

Service Plants
Los Angeles, Calif.
Oklahoma City, Okla.

Main Office and Works
Houston, Texas

Export Office
New York, U.S.A.





The above photograph shows an airplane view of the main plant of the Hughes Tool Company, Houston, Texas, the home of

HUGHES
Chrome Nickel Cast Steel
VALVES and FITTINGS
for Refinery Service.

Design, material, workmanship and tests, combine to assure a product of proven superior performance.

—

Your inquiry earnestly solicited.

—

"HUGHES Tools Sold By Supply Stores Everywhere"

HUGHES TOOL COMPANY

Service Plants
Los Angeles, Calif.
Oklahoma City, Okla.

MAIN OFFICE AND PLANT
HOUSTON, TEXAS

Export Office
New York City, N.Y.

REFINERY AND NATURAL GASOLINE PLANT
EQUIPMENT BUYERS' GUIDE
1927

THE following pages give a complete list of all equipment used in refineries and natural gasoline plants, together with the name and address of recognized manufacturers and dealers. They contain information that is invaluable to those buying equipment for this branch of the Petroleum Industry.

The BUYERS' GUIDE is compiled annually by the editorial staff of The Refiner and Natural Gasoline Manufacturer under the supervision of A. R. McTee. No expense is spared in securing complete and authentic information and in arranging the Guide for the convenience of refiners and gasoline plant men. However, it is only through the close co-operation of the many manufacturers and dealers that such a Guide is available.

The value of the Guide to you will be determined by the use you make of it. It is urged that it be kept handy for easy reference whenever plant equipment purchases are to be made.

Directions for Use

Information in the Guide has been arranged according to products, classified under their most common and accepted names and using the main noun as the key index word. However, exceptions have been made to the latter in cases where equipment is more generally known by a combination of words. All concerns listed in the Guide who have advertisements in this issue of The Refiner and Natural Gasoline Manufacturer have been designated by prominent type and reference, "See Advertisers' Index." Much valuable information can be secured by following these references.

PLANT EQUIPMENT BUYERS' GUIDE

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C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
GASOLINE RECOVERY CORP., Peoples Bank Bldg., Charleston, W. Va. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HOPE ENGINEERING & SUPPLY CO., Mount Vernon, Ohio. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, California. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Calif. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
American Tank Co., Okla. City, Okla.
Beach-Russ Co., 30 Church St., New York, N. Y.
Carbondale Machine Co., Carbondale, Pa.
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McNamara Brothers Co., Westport, Baltimore, Md.
Mount Cooper Boiler & Iron Co., Tulsa, Okla.
New York Engineering Co., 2 Rector St., New York, N. Y.
Pioneer Tank and Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Tracy Engineering Co., 479-485 Sixth St., San Francisco, Calif.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

ABSORBERS, Ammonia

YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

ABSORBERS, Charcoal Gasoline Plants

GASOLINE RECOVERY CORP., Peoples Bank Bldg., Charleston, W. Va. See Advertisers' Index.

ABSORPTION PLANTS

FLUOR CONSTRUCTION CO., 909 East 59th St., Los Angeles, Calif. See Advertisers' Index.

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American Iron Works, Inc., Louisville, Ky.
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Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles Calif.
Mesta Machine Co., Pittsburgh, Pa.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Walsh & Weidner Boiler Co., 357 Humble Bldg., Houston, Texas.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.

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Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carbic Mfg. Co., Duluth, Minn.
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Cox Brass Mfg Co., Albany, N. Y.
Davis Bouronville Co., 141-43 W. Austin Ave., Chicago, Ill.
Diamond Rubber Co., Inc., Akron, Ohio.
Henderson-Willis Welding & Cutting Co., 2305-09 N. Eleventh St., St. Louis, Mo.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
MacLeod Company, Cincinnati, Ohio
Magnoila Gas Porducts Co., Houston, Tex.
Oxweld Acetylene Co., Long Island City, L. I. N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

ACETYLENE, Dissolved

The Prest-O-Lite Co., Inc., 810 Kirby Bldg., Dallas, Texas.

AERATORS

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D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
Fort Worth Steel & Machinery Co., Fort Worth, Texas

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UNITED IRON WORKS CO., Ridge Arcade, Bldg., Kansas City, Mo. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
American Iron Works, Inc., Louisville, Ky.
Arctic Ice Machine Co., Canton, Ohio
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Cochrane Corp., 17th and Clearfield Sts., Philadelphia, Pa.
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
National Pipe Bending Co., New Haven, Conn.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Whitlock Coil Pipe Co., Hartford, Conn.

AGITATORS

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kans. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
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WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Abrasive Metals Co., 50 Church St., New York, N. Y.
Arctic Ice Machine Co., Canton, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Beach-Russ Co., 30 Church St., New York, N. Y.
Blaw-Knox Co., Pittsburgh, Pa.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Hardinge Co., Inc., York, Pa.
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Leader Iron Works, Decatur, Ill.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
Mount Cooper Boiler & Iron Co., Tulsa, Okla.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., 942 Curry Bldg., Pittsburgh, Pa.
Premier Mill Corporation, Geneva New York.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
M. H. Treadwell Co. of Ill., 208 So. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
Walsh & Weidner Boiler Co., 357 Humble Bldg., Houston, Texas.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.
York Products Corporation, Houston, Texas.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

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Samuel Smith & Son Co., Paterson, N. J.
United Lead Co., 111 Broadway, New York, N. Y.

ALARMS, Water Motor (Sprinkler)

Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.

ALTERNATORS

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Burke Electric Co., Erie, Pa.
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
Engberg's Electric & Mechanical Works, 268 Vine St., St. Joseph, Mich.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Fort Worth Steel & Machinery Co., Fort Worth, Texas.
Ridgway, Dynamo & Engine Co., Ridgway, Pa.
Roth Bros. & Co., 1400 W. Adams St., Chicago, Ill
Southern Engine & Pump Co., Houston, Texas

ALUMINUM POWDER

Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
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John F. Nolan Co., 3100 Butler St., Houston, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.

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THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

Central Scientific Co., 460 E. Ohio St., Chicago, Ill.

The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
Langstadt-Meyer Co., Appleton, Wis.

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C. F. BRAUN & CO., Alhambra, Calif. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
The Hays Corporation, Michigan City, Ind.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.

ANALYZERS, Flue Gas

Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
The Hays Corporation, Michigan City, Ind.

ANCHORS, Pipe

POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.

ANEMOMETERS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
The Hays Corporation, Michigan City, Ind.
Keuffel & Esser Co., Hoboken, N. J.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Taylor Instrument Co., Rochester, New York.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

APPARATUS, Aluminum

Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
J. P. Devine Co., 1580 Clinton, Buffalo, N. Y.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.

ARC WELDERS, Electric

Henderson-Willis Welding & Cutting Co., 2305-09 N. Eleventh St., St. Louis, Mo.

ARCHES, Boiler

GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
WALSH FIRE CLAY PRODUCTS CO., 4073 N. Main St., St. Louis, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kan. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Burke Engineering Co., Holland, Mich.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Chicago Tile Arch Furnace Co., 2600-10 W. Grand Ave., Chicago, Illinois
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
M. H. Detrick Co., 140 So. Dearborn St., Chicago, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Lamprey Co., Westfield, Mass.
Liptak Fire-Brick Arch Co., Mexico, Mo.
McLeod & Henry Co., Troy, N. Y.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Quinn & Co., 1347 Harrison Ave., Cincinnati, Ohio
Sculley Steel & Iron Co., Chicago, Ill.
Sprague Foundry & Mfg. Co., P. O. Box 334, Council Bluffs, Iowa
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Union Iron Works, Selma, Ala.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
Walsh & Weidner Boiler Co., 357 Humble Bldg., Houston, Texas.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Wellsville Fire Brick Co., Wellsville, Mo.

ARCHES, Combustion Chamber

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
WALSH FIRE CLAY PRODUCTS CO., 4073 N. Main St., St. Louis, Mo. See Advetisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.

Bass Foundry & Machine Co., Fort Wayne, Ind.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Burke Engineering Co., Holland, Mich.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Chicago Tile Arch Furnace Co., 2600-10 W. Grand Ave., Chicago, Illinois
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
M. H. Detrick Co., 140 So. Dearborn St., Chicago, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
Green Engineering Co., E. Chicago, Ind.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Hartwell Iron Works, Houston, Texas
Liptak Fire-Brick Arch Co., Mexico, Mo.
McLeod & Henry Co., Troy, N. Y.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Quinn & Co., 1347 Harrison Ave., Cincinnati, Ohio
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Wellsville Fire Brick Co., Wellsville, Mo.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

ARCHES. Fire Door

GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
WALSH FIRE CLAY PRODUCTS CO., 4073 N. Main St., St. Louis, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
M. H. Detrick Co., 140 So. Dearborn St., Chicago, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
James Gardner, Jr., Co., Ebensburg, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
International Engineering Works, Inc., Framingham, Mass.
Lamprey Co., Westfield, Mass.
McLeod & Henry Co., Troy, N. Y.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Sprague Foundry & Mfg. Co., P. O. Box 334, Council Bluffs, Iowa
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Union Iron Works, Selma, Ala.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Wellsville Fire Brick Co., Wellsville, Mo.

ARCHES, Flat Suspended

LACLEDE - CHRISTY CLAY PRODUCTS CO., St. Louis, Mo. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
WALSH FIRE CLAY PRODUCTS CO., 4073 N. Main St St. Louis, Mo. See Advertisers Index.

The Brady Conveyors Corp., 20 W Jackson Blvd., Chicago, Ill.
Burke Engineering Co., Holland Mich.
Chicago Tile Arch Furnace Co 2600-10 W. Grand Ave., Chicago Illinois
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
M. H. Detrick Co., 140 So. Dearborn St., Chicago, Ill.
James Gardner, Jr., Co., Ebensburg, Pa.
Green Engineering Co., E. Chicago Ind.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
M. A. Hofft Co., Indianapolis, Ind
McLeod & Henry Co., Troy, N. Y
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas
Quinn & Co., 1347 Harrison Ave. Cincinnati, Ohio
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
Wellsville Fire Brick Co., Wellsville, Mo.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

ARRESTORS, Flame

OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

ARRESTORS, Lightning

General Electric Co., Schenectady New York
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.

ASBESTOS PRODUCTS

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
JOHNS-MANVILLE INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Acme Asbestos Cov. & Supply Co., 2442 N. Elizabeth St., Chicago, Ill.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
R. V. Aycock Co., Kansas City, Mo.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Stewart R. Browne Mfg. Co., New York, N. Y.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
General Asbestos & Rubber Co., Charleston, S. C.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Langstadt-Meyer Co., Appleton, Wis.
National Supply Co., Toledo, Ohio
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Norristown Mangesia & Asbestos Co., Norristown, Pa.
Philip Carey Co., Cincinnati, Ohio
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.

Rogers Asbestos Co., Houston, Texas.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Witherup Cork Packing Co., Beaumont, Texas.

B

BABBITT

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.

Brazelton, Wessendorff & Nelms, Houston, Texas.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
The Wm. Cramp & Sons Ship & Engine Bldg. Co., Richmond & Norris Sts., Philadelphia, Pa.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Eagle-Picher Lead Co., 208 S. LaSalle St., Chicago, Ill.
Eastwood Wire Mfg. Co., Belleville, N. J.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Frictionless Metal Co., 1450-60 Collins St., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hoyt Metal Co., Boatman's Bank Bldg., St. Louis, Mo.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Union Iron Works, Selma, Ala.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

BABBITTING OUTFITS

BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.

Brazelton, Wessendorff & Nelms, Houston, Texas.
Eclipse Fuel Engineering Co., Rockford, Ill.
Pittsburgh White Metal Co., 160 Leroy St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.

BAFFLES, Absorber

Dean E. Foster, New Wright Bldg., Tulsa, Okla.

BAFFLES, Boiler

PLIBRICO JOINTLESS FIRE BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index
QUIGLEY FURNACE SEPCIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

American Chimney Corp., 147 Fourth Ave., New York, N. Y.
Boiler Engineering Co., 760 Broad St., Newark, N. J.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Edge Moor Iron Co., Edge Moor, Delaware.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Jas. G. Heggie & Sons, Joliet, Ill.
E. Keeler Co., Williamsport, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
McLeod & Henry Co., Troy, N. Y.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Wellsville Fire Brick Co., Wellsville, Mo.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

BAFFLES, Refractory

QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Betson-Jewell, Inc., Rome, N. Y.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
M. H. Detrick Co., 5319 Marcus Ave., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., 17 Battery Place, New York, N. Y.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
A. P. Green Fire Brick Co., Mexico, Mo.
Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
King Refractories Co., Inc., 1709 Niagara St., Buffalo, N. Y.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McLeod & Henry Co., Troy, N. Y.
S. Obermayer Co., 2563 W. 18th St., Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
United States Refractories Corp'n., Mount Union, Pa.
Wellsville Fire Brick Co., Wellsville, Mo.

BAFFLE WALLS

JOHNS-MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.

Betson-Jewell, Inc., Rome, N. Y.
Boiler Engineering Co., 760 Broad St., Newark, N. J.
Denver Fire Clay Co., 742 Champa, Denver, Colo.
Engineer Co., 17 Battery Place, New York, N. Y.
Eureka Fire Brick Co., 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
King Refractories Co., Inc., 1709 Niagara St., Buffalo, N. Y.
McLeod & Henry Co., Troy, N. Y.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Wellsville Fire Brick Co., Wellsville, Mo.

BALANCES, Analytical

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 8 8½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Emil Greiner Co., 55 Fulton St., New York, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.

BALANCES, Spring

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Griebel Instrument Co., Carbondale, Pa.
Humboldt Manufacturing Co., 2014 Nebraska Ave., Chicago, Ill.

SAWS, Band

Continental Supply Co., St. Louis, Missouri
Gallmeyer & Livingston Co., 300 Straight Ave., S. W. Grand Rapids, Mich.
Hall & Brown Wood Working Machine Co., Broadway, Tyler & Ninth Sts., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
National Supply Co., Toledo, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
George W. Smith Co., Dallas, Tex
Texas Belting Co., Houston, Texas.
Union Iron Works, Selma, Ala.

BAROMETERS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEER-CORP., Box 1402, Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chesnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Kolesch & Co., 138 Fulton St., New York, N. Y.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Taylor Instrument Co., Rochester, New York.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

BARRELS

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Steel Package Co., Defiance, Ohio.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Hardwood Package Co., Marcus Hook, Pa.
C. G. Hopkins Cooperage Co., Joplin, Mo.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Pekin Cooperage Co., 330 Spring St., New York, N. Y.
Peekin Cooperage Co., Port Arthur, Texas.
Petroleum Iron Works, Sharon, Pa.
Union Iron Works, Selma, Ala

BARS, Reinforcing Concrete Work

WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.

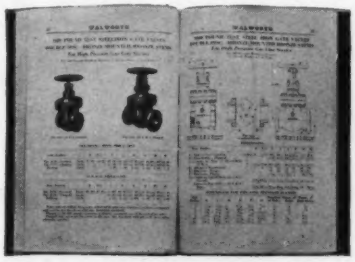
American Iron Works, Inc., Louisville, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Hartwell Iron Works, Houston, Texas
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Quincy, Ill.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill. Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Texas Carnegie Steel Assn., Galveston, Texas.
Union Iron Works, Selma, Ala.

BEAMS, Steel

TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade, Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Eastern Steel Co., Pottsville, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Quincy, Ill.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Texas Carnegie Steel Assn., Galveston, Texas.
Union Iron Works. Selma, Ala.

Walworth Sigma Steel Wedge Gate Valves



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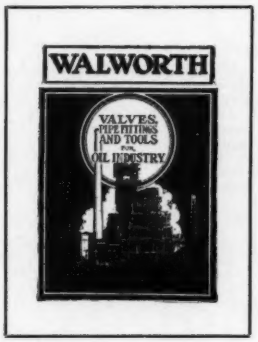

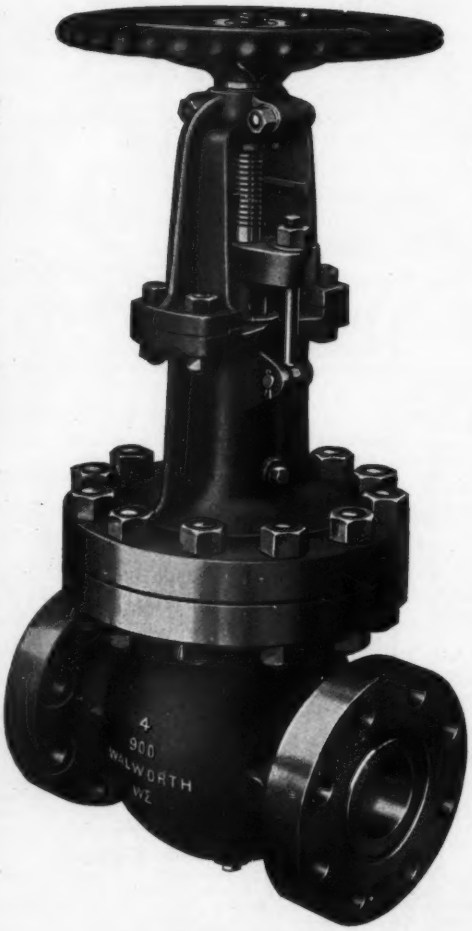

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Rogers Asbestos Co., Houston, Texas.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.

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Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
F. W. Gartner Co., Houston, Texas.
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Oil Well Supply Co., Pittsburgh, Pa.
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Sculley Steel & Iron Co., Chicago, Ill.
Union Iron Works, Selma, Ala.

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CELITE PRODUCTS CO., 1320 South Hope St., Los Angeles, Calif. See Advertisers' Index.

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R. V. Aycock Co., Kansas City, Mo.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
Insulating Products Co., 1601 Fulford St., Kalamazoo, Michigan.
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Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
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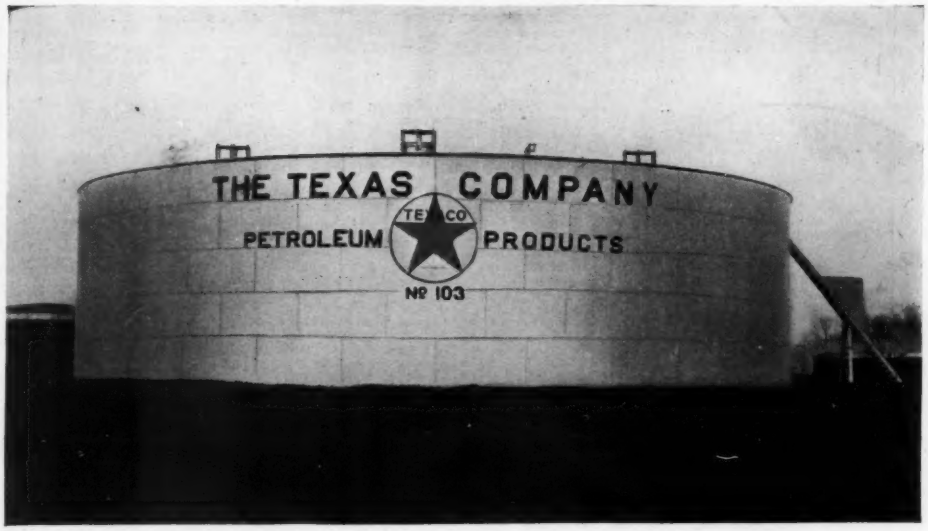

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Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
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Union Steam Pump Co., Battle Creek, Mich.

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PLIBRICO JOINTLESS FIRE BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

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Herbert Boiler Co., Root & La-Salle Sts., Chicago, Ill.
Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
International Heater Co., 101 Park Ave. Utica, N. Y.
E. Keeler Co., Williamsport, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kewanee Boiler Co., Kewanee, Ill.
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National Supply Co., Toledo, Ohio
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Oswego Boiler & Engine Co., Oswego, N. Y.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Boiler Works, 12th and Pa. Ave., Erie, Pa.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The Stanwood Corp., Cincinnati, O.
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The Union Iron Works, Erie, Pa.
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The Youngstown Boiler & Tank Co., Youngstown, Ohio

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Bigelow Co., 76 River St., New Haven, Conn.
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Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Continental Supply Co., St. Louis, Missouri
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The Cullen Co., Clinton, Iowa
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erie City Iron Works, Erie, Pa.
R. B. Everett Co., Houston, Texas
A. B. Farquhar, Co., Ltd., 142 N. Duke St., York, Pa.
Fitzgibbons Boiler Co., Inc., 47 W. 42nd St., New York, N. Y.
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Harrisburg Star Boiler Corp., 15 Park Row, New York City.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Herbert Boiler Co., Root & La-Salle Sts., Chicago, Ill.
Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Engineering Works, Inc., Farmingham, Mass.
E. Keeler Co., Williamsport, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kewanee Boiler Co., Kewanee, Ill.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
James Leffel & Co., Springfield, O.
E. Leonard & Sons, Ltd., York St., London, Canada.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McNamar Boiler Works, Bridgeport, Ill.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Quincy, Ill.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
John Mohr & Sons, 96th and Calumet River, Chicago, Ill.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nagle Engine & Boiler Works, Erie, Pa.
National Supply Co., Toledo, Ohio
New York Engineering Co., 2 Rector St., New York, N. Y.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Ontario Iron Works, Pulasky, N. Y.
Oswego Boiler & Engine Co., Oswego, N. Y.
Page Water Tube Boiler Co., 815-819 Larrabee St., Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Boiler Works, 12th and Pa. Ave., Erie, Pa.
The Randle Machinery Co., 1723 Power St., Cincinnati, O.
Titusville Iron Works, Titusville, Pa.
The Union Iron Works, Erie, Pa.
Union Iron Works, Selma, Ala.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
Howard J. Webster, Harrison Bldg., Philadelphia, Pa.
Wickes Boiler Co., Saginaw, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

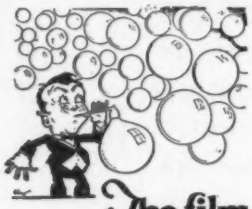
BOILERS, Low Pressure

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

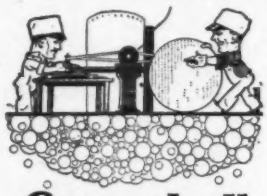
American Iron Works, Inc., Louisville, Ky.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
Bigelow Co., 76 River St., New Haven, Conn.
Bridgeport Boiler Works Co., Bridgeport, Conn.
The Brownell Co., Dayton, Ohio
Continental Supply Co., St. Louis, Missouri
The Cullen Co., Clinton, Iowa
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
Erie City Iron Works, Erie, Pa.
Fitzgibbons Boiler Co., Inc., 47 W. 42nd St., New York, N. Y.
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York, N. Y.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Harrisburg Star Boiler Corp., 15 Park Row, New York City.
Jas. G. Heggie & Sons, Joliet, Ill.
Herbert Boiler Co., Root & La-Salle Sts., Chicago, Ill.

-how many bubbles to a cubic foot?

and how many sq. feet of bubble film to one cubic foot?



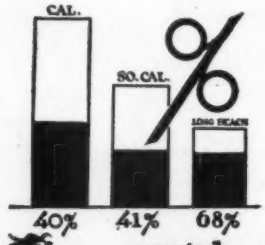
The film on the bubble draws the gasoline out of the gas!



Campbell Business is built on BUBBLES!

Stop the dollars from rolling down the gas line!

43 operating for one large California Company



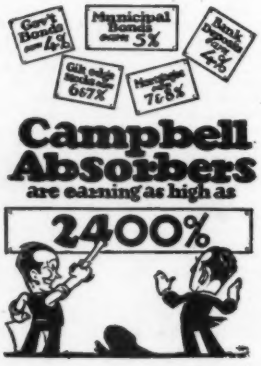
watch CAMPBELL production percentages GROW!

The CAMPBELLS are coming!

Campbell
Absorbers
are
"doing their stuff"

J. A. Campbell

Natural Gas Engineer
Consulting—Designing—Construction
P. O. Box 669 Long Beach, Calif.



CAMPBELL
OIL FROTH
absorber

A record without parallel

Here's what Campbell has accomplished in 18 months!

The percentage of all gasoline now extracted from natural gas by Campbell Oil-Froth Absorbers is as follows:

In Calfiornia	60%
Seal Beach	100%
Alamitos Heights	100%
Ventura Avenue	95%
Long Beach	75%
Southern California	65%

J. A. Campbell

Consulting—Designing—Construction
Natural Gas Engineer

P. O. Box 669 **Long Beach, Calif.**

CAMPBELL
OIL FROTH
absorber

Look how these records "stack up"

Phenomenal increases in production of natural gasoline

The following are cases selected at random indicating the increase in production of gasoline where Campbell Oil-Froth Absorbers have been installed:

Case	Production previous to change	Production after change	Case	Production previous to change	Production after change
A	8,600	13,100	G	6,300	7,400
B	19,300	26,000	H	5,900	6,500
C	11,500	20,000	I	56,000	63,000
D	10,000	11,900	J	2,900	3,500
E	6,000	7,100	K	4,300	5,100
F	8,000	8,900	L	5,200	6,100

J. A. Campbell

Natural Gas Engineer

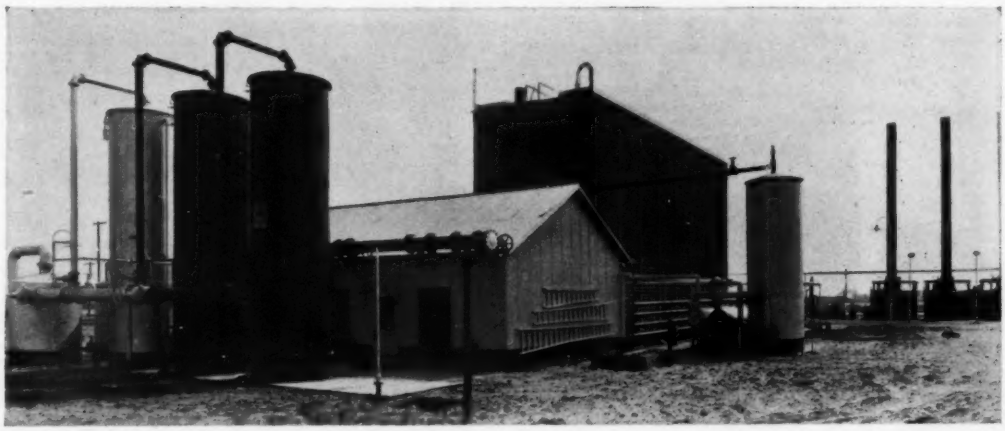
Consulting—Designing—Construction

P. O. Box 669 **Long Beach, Calif.**

CAMPBELL

OIL FROTH

absorber



Thorough absorption *of* natural gasoline

—The result of ten years of specialization—concentrating our entire efforts on the treatment of natural gas. The Campbell record speaks for itself.

Campbell Oil-Froth Absorbers are available in various sizes—to handle any capacity of gas. Operating pressures of from 40 to 450 lbs.

Ask for Catalog

J. A. Campbell

Natural Gas Engineer
Consulting—Designing—Construction
P. O. Box 669 **Long Beach, Calif.**

CAMPBELL
OIL FROTH
absorber

Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Engineering Works, Inc., Framingham, Mass.
International Heater Co., 101 Park Ave. Utica, N. Y.
E. Keeler Co., Williamsport, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kewanee Boiler Co., Kewanee, Ill.
Keystone Boiler & Foundy Co., Landisville, Pa.
Lamprey Co., Westfield, Mass.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
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National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Ontario Iron Works, Pulasky, N. Y.
Oswego Boiler & Engine Co., Oswego, N. Y.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
The Stanwood Corp., Cincinnati, O.
Titusville Iron Works, Titusville, Pa.
The Union Iron Works, Erie, Pa.
Union Iron Works, Selma, Ala.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Howard J. Webster, Harrison Bldg., Philadelphia, Pa.
Wickes Boiler Co., Saginaw, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

BOILER SCALE TREATMENT

Boiler Kote Co., 608 S. Dearborn St., Chicago, Ill.

BOILERS, Tubular Horizontal

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
American Iron Works, Inc., Louisville, Ky.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
Bigelow Co., 76 River St., New Haven, Conn.
Bridgeport Boiler Works Co., Bridgeport, Conn.
The Brownell Co., Dayton, Ohio
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Continental Supply Co., St. Louis, Missouri
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Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Engineering Works, Inc., Framingham, Mass.
International Heater Co., 101 Park Ave. Utica, N. Y.
E. Keeler Co., Williamsport, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St.. Kansas City, Mo.
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James Leffel & Co., Springfield, O.
E. Leonard & Sons, Ltd., York St., London, Canada.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Lucey Mfg. Corp'n., Woolworth Bldg., New York, N. Y.
McEwen Bros., Wellsville, N. Y.
McNamar Boiler Works, Bridgeport, Ill.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Quincy, Ill.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
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National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Oswego Boiler & Engine Co., Oswego, N. Y.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
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The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The Stanwood Corp., Cincinnati, O.
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The Union Iron Works, Erie, Pa.
Union Iron Works, Selma, Ala.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Howard J. Webster, Harrison Bldg., Philadelphia, Pa.
Western Gas Construction Co., Fort Wayne, Ind.
Wickes Boiler Co., Saginaw, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

BOILERS, Vertical

Lookout Boiler & Mfg. Co., Chattanooga, Tenn.

BOILERS, Water Tube

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada.
Bass Foundry & Machine Co., Fort Wayne, Ind.
The Badenhausen Corp., 1011 Chestnut St., Philadelphia, Pa.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Bigelow Co., 76 River St., New Haven, Conn.
Bridgeport Boiler Works Co., Bridgeport, Conn.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
The Cullen Co., Clinton, Iowa.
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Edge Moor Iron Co., Edge Moor, Delaware.
Erie City Iron Works, Erie, Pa.
R. B. Everett Co., Houston, Texas
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Harrisburg Star Boiler Corp., 15 Park Row, New York City.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Herbert Boiler Co., Root & La-Salle Sts., Chicago, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Engineering Works, Inc., Framingham, Mass.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
E. Keeler Co., Williamsport, Pa.
Keystone Boiler & Foundy Co., Landisville, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
Nagle Engine & Boiler Works, Erie, Pa.
National Supply Co., Toledo, Ohio
New York Engineering Co., 2 Rector St., New York, N. Y.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Ontario Iron Works, Pulasky, N. Y.
Oswego Boiler & Engine Co., Oswego, N. Y.
Page Water Tube Boiler Co., 815-819 Larrabee St., Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The Union Iron Works, Erie, Pa.
Union Iron Works, Selma, Ala.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
Wickes Boiler Co., Saginaw, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SETTINGS, Boiler

PLIBRICO JOINTLESS FIREBRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y. See Advertisers' Index.
GEO. P. REINTJES Co., 2517 Jefferson St., Kansas City, Mo. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
Erie City Iron Works, Erie, Pa.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.

BOLTS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
YORK MANUFACTURING CO., York Pa., See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Bethlehem Steel Co., Bethlehem, Pa.
Brazelton, Wessednorff & Nelms, Houston, Texas.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Union Iron Works, Selma, Ala.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Wm. Wharton, Jr. & Co., Inc., 30 Church St., New York, N. Y.

BOLTS, Boiler

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Fort Worth Steel & Machinery Co., Fort Worth, Texas
International Heater Co., 101 Park Ave. Utica, N. Y.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Union Iron Works, Selma, Ala.

BOLTS, Brass

Arthur Harris & Co., 212 Curtis St., Chicago, Ill.

BOLTS, Tank

Black, Sivalls & Bryson, Bartlesville, Okla.

BOLTS AND NUTS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
The Alcumite Corporation, Dayton, Ohio.
American Iron Works, Inc., Louisville, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Gulf Coast Machine & Supply Co., Beaumont, Texas.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Union Iron Works, Selma, Ala.

BOMBS AND GAUGES

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
C. J. Tagliabue Mfg Co., 18 33rd St., Brooklyn, N. Y.

BOOSTERS, Gas

CLARK BROS. CO., Olean, N. Y. See Advertisers' Index.
COOPER, C. & G., CO., Mt. Vernon, Ohio. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.

Bayley Mfg. Co., 73 Greenbush St., Milwaukee, Wis.
Beach-Russ Co., 30 Church St., New York, N. Y.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Connersville Blower Co., Connersville, Ind.
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
The P. H. & F. M. Roots Co., Connersville, Ind.
B. F. Sturtevant Co., Hyde Park, Boston, Mass.

STATIONS, Booster

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.

BORERS, Bung

WEIMAR ENGINEERING WORKS, Westmoreland & Jasper St., Philadelphia, Pa.

BOTTLES, Oil Sample

FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See advertisers' Index.

W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Whitall-Tatum Co., Philadelphia, Pa.

BOXES, Condensing

GRAVER CORP., 414 Todd Ave., E. Chicago, Ind. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
THE KAW BOILER WORKS, CO., Kansas City, Kansas. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
Dover Boiler Works, 50 Church St., New York, N. Y.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Hartwell Iron Works, Houston, Texas
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
National Supply Co., Toledo, Ohio
New York Engineering Co., 2 Rector St., New York, N. Y.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Standard Tank Car Co., Sharon, Pa.
Treadwell Construction Co., Midland, Pa.

BOXES, Cooling

GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge, Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
Dover Boiler Works, 50 Church St., New York, N Y.
Finucane Boiler Works, Houston, Texas.
Hartwell Iron Works, Houston, Texas
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
National Supply Co., Toledo, Ohio
New York Engineering Co., 2 Rector St., New York, N. Y.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

BOXES, Junction

OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.

Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
Langstadt-Meyer Co., Appleton, Wis.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
The Pyle-National Co., 133. N. Kostner Ave., Chicago, Ill.
Standard Steel Works, Kansas City, Mo.

BOXES, Knockout

C. F. BRAUN & CO., Alhambra, Calif. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Fort Worth Steel & Machinery Co., Fort Worth, Texas
Langstadt-Meyer Co., Appleton, Wis.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Standard Steel Works, Kansas City, Mo.

BOXES, Look

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, O. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., WICHITA, KANSAS. See Advertisers' Index.

Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
McEwen Bros., Wellsville, N. Y.
E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.

BOXES, Receiving

Joseph Reid Gas Engine Co., Oil City, Pa.

BOXES, Shop

Lyon Metallic Mfg. Co., Aurora, Ill.

BOXES, Tool

Brazelton, Wessendor¾ & Nelms, Houston, Texas.
Lyon Metallic Mfg. Co., Aurora, Ill.

BOXES, Waste

Lyon Metallic Mfg. Co., Aurora, Ill.

BRAKES, Electric

ELECTRIC CONTROLLER & MFG. CO., 2700 E. Seventy-Ninth St., Cleveland, Ohio. See Advertisers' Index.

BRAKE LINING

General Asbestos & Rubber Co., Charleston, S. C.

BRAKE LINING, Asbestos

Keasbey & Mattison Co., Ambler, Pa.

BRASS GOODS

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Cox Brass Mfg Co., Albany, N. Y.
DeSoto Foundry & Machine Co., Mansfield, La.
Dole Valve Co., 1923-33 Carroll Ave., Chicago, Ill.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Hart Co., Inc., Williamsport, Pa.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Southern Brass Mfg. Co., Houston, Texas.
Union Water Meter Co., Worcester, Mass.

BRASS, Sheet

American Brass Co., Waterbury, Conn.
American Lubricator Co., Detroit, Mich.
Bridgeport Brass Co., Bridgeport, Conn.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Cox Brass Mfg Co., Albany, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Southern Brass Mfg. Co., Houston, Texas.

BRAZING APPARATUS

Brazelton, Wessendorff & Nelms, Houston, Texas.
Cox Brass Mfg Co., Albany, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

BREECHINGS, Boiler

GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

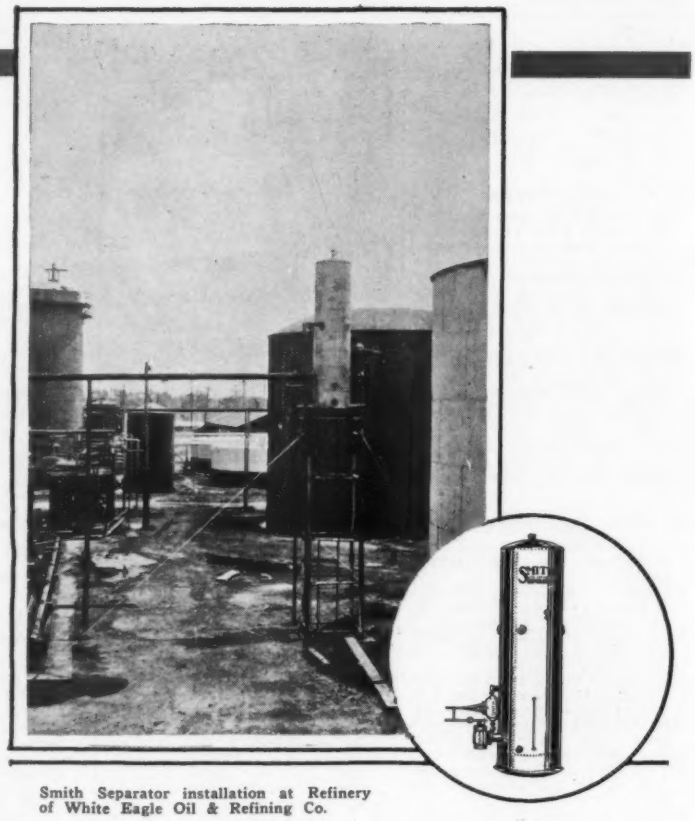
American Chimney Corp., 147 Fourth Ave., New York, N. Y.
American Iron Works, Inc., Louisville, Ky.
American Tank Co., Okla. City, Okla.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
The Brownell Co., Dayton, Ohio
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis Mo.
Hersh Brothers Co., 645 Mill St., Allentown, Pa.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
International Engineering Works, Inc., Framingham, Mass.
Kansas City Structural Steel Co., Kansas City, Kansas.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McEwen Bros., Wellsville, N. Y.
McNamar Boiler Works, Bridgeport, Ill.
McNamara Brothers Co., Westport, Baltimore, Md.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.

TO THE NATURAL GAS

SMITH SEPARATORS

Natural gasoline refiners are using Smith Separators to secure the final separation of oil and gas at the refinery.

Photo at right shows installation of a Smith Separator at the refinery of the White Eagle Oil and Refining Company, to handle all gasoline from 20 Burton Stills, saving gas for five boilers developing 250 H. P.



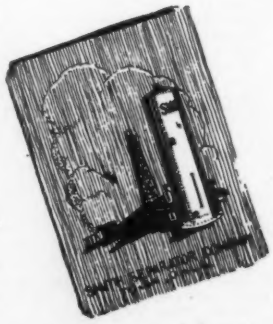
Smith Separator installation at Refinery of White Eagle Oil & Refining Co.

Unskilled labor can lay line faster with Victaulic Couplings

Victaulic Couplings

This new, sensational pipe coupling has become a popular favorite with pipe line companies, refiners . . with everyone using pipe lines for any purpose.

Its simplicity of construction . . . ease of laying with unskilled labor . . . speed of handling the laying of line . . . all combine to make it popular wherever used.



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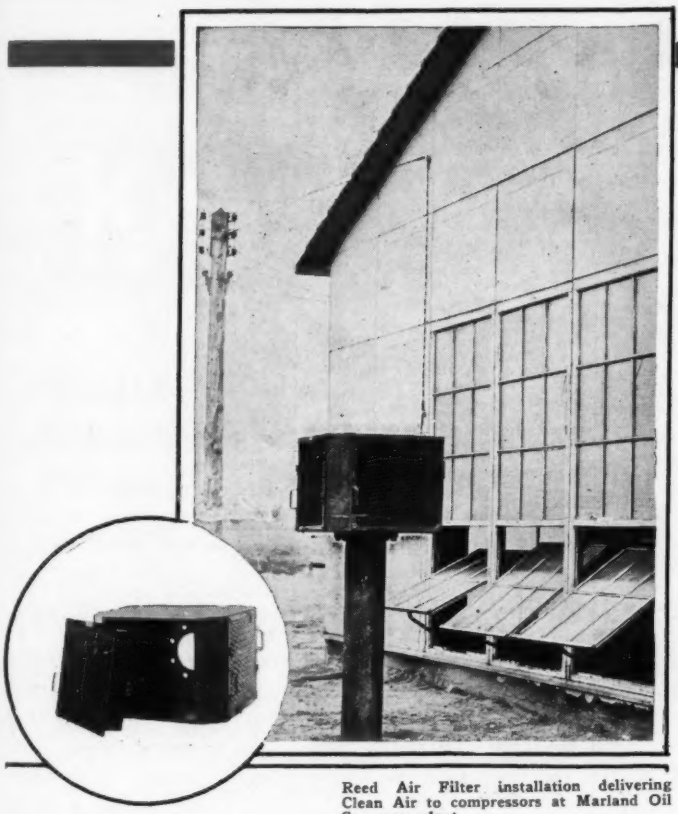
25 Bishopsgate
Cable Address:
"Oleborers", London
Louisiana Office:
405 Forest Ave.,
Shreveport, La.

OLINE MANUFACTURER

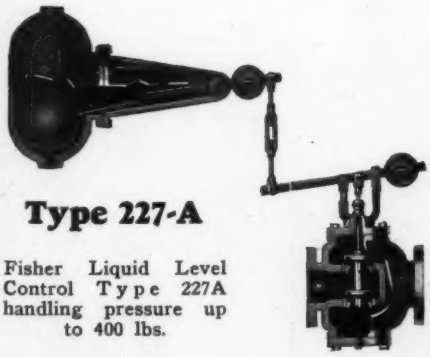


Reed Air Filter installation delivering Clean Air to compressors at Marland Oil Company plant.

REED AIR FILTERS

Reed Air Filters are delivering clean, dust free air to compressors and engines throughout practically every branch of the Oil Industry.

The saving effected from the use of Reed Air Filters, by saving costly repairs and shut-down time on engines and compressors have made this equipment popular wherever tested.



Type 227-A

Fisher Liquid Level Control Type 227A handling pressure up to 400 lbs.

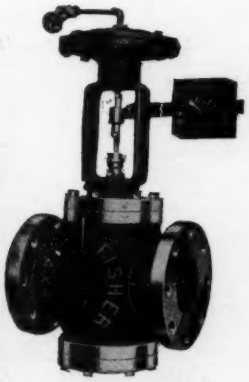
FISHER EQUIPMENT

Fisher refinery equipment is standard with practically every natural gasoline refiner in the industry.

Practically every piece of Fisher Equipment which is considered standard today was originally built to meet some refining need. Service on the job made it standard.

Type 240

Fisher Remote Control Type 240. The only valve of its kind available for handling liquid level remote controls under any pressure or temperature.



Type 10

Fisher Pressure Reducing Valve Type 10, popular because of wide variety of uses.

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SMITH SEPARATOR COMPANY

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London Office:
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25 Bishopsgate
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Louisiana Office:
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Shreveport, La.

Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
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BREECHINGS, Smoke

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Dover Boiler Works, 50 Church St., New York, N. Y
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
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Heine Boiler Co., St. Louis, Mo.
Hersh Brothers Co., 645 Mill St., Allentown, Pa.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
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McEwen Bros., Wellsville, N. Y.
McNamar Boiler Works, Bridgeport, Ill.
McNamara Brothers Co., Westport, Baltimore, Md.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
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Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
New York Engineering Co., 2 Rector St., New York, N. Y.
R. S. Newbold & Son Co., Norristown, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
The Petroleum Iron Works Co., Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rust Engineering Co., 502 District National Bank Bldg., Washington, D. C.
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Superior Machine & Boiler Works, 840 W. Suverior, Chicago, Ill.
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Treadwell Construction Co., Midland, Pa.
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The Youngstown Boiler & Tank Co., Youngstown, Ohio

BRICK, Chemical

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BRICK, Fire

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
LACLEDE-CHRISTY, St. Louis, Mo. See Advertisers' Index.
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REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WALSH FIRE CLAY PRODUCTS CO., 4073 N. Main St., St. Louis, Mo. See Advertisers' Index.

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American Chimney Corp., 147 Fourth Ave., New York, N. Y.
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Bernitz Furnace Appliance Co., 80 Federal St., Boston, Mass.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
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Crescent Refractories Co., Curwensville, Pa.
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Elgin Butler Brick & Tile Co., Austin, Texas
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
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Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh, Pa.
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F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kier Fire Brick Co., 1844 Oliver Bldg., Pittsburgh, Pa.
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Norton Co., Worcester, Mass.
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Pe olin Co. of America, 1112 W. 37th St., Chicago, Illinois
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Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Pyro Clay Products Co., Oak Hill, Ohio.
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Rogers Asbestos Co., Houston, Texas.
Rust Engineering Co., 502 District National Bank Bldg., Washington, D. C.
Southern Refractories Co., Fort Payne, Alabama.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
United States Refractories Corp'n., Mount Union, Pa.
Wellsville Fire Brick Co., Wellsville, Mo.
Western Gas Construction Co., Fort Wayne, Ind.

BRICK, Insulating

BANNER ROCK PRODUCTS CO., Alexandria, Ind. See Advertisers' Index.
CELITE PRODUCTS CO., 1320 South Hope St., Los Angeles, Calif. See Advertisers' Index.
JOHNS-MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y. See Advertisers' Index.

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American Gas Construction Co., Newton, Iowa
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
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Eclipse Fuel Engineering Co., Rockford, Ill.
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Rogers Asbestos Co., Houston, Texas.
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Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

BRUSHES, Paint

COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.

BRUSHES, Wire

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.

BUILDINGS, Industrial

Rust Engineering Co., 502 District National Bank Bldg., Washington, D. C.

BUILDINGS, Metal

Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.

BUILDINGS, Steel

NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City. Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

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Elaw-Knox Co., Pittsburgh, Pa.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chicago Steel Car Co., Chicago, Ill.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
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Industrial Construction Company, North Peoria Road, Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Quincy, Ill.
Milliken Bros. Mfg. Co., 2395 Woolworth Bldg., New York, N. Y.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Pioneer Tank & Boiler Co., Box 1926, Tulsa Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
George W. Smith Co., Dallas, Tex.
Texas Carnegie Steel Assn., Galveston, Texas.
Truscon Steel Co., Youngstown, O.
Western Gas Construction Co., Fort Wayne, Ind.

BULBS, Rectifier

Brazelton, Wessendorff & Nelms, Houston, Texas.
Langstadt-Meyer Co., Appleton, Wis.

BURNERS, Boiler

LEE B. METTLER CO., 406 S. Main St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Black, Sivalls & Bryson, Bartlesville, Okla.
Continental Supply Co., St. Louis, Missouri
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Duquesne Burner Service Co., 5031 Jenkins Arcade Bldg., Pittsburgh, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
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Fess System Co., 220 Natoma St., San Francisco, Calif.
John Foerst & Sons, Box 54, Bayonne, N. J.
Fuller-Lehigh Co., Fullerton, Pa.
Gas Combustion Co., P. O. Box 1753, Pittsburgh, Pa.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Maxon Premix Burner Co., Muncie, Ind.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
National Supply Co., Toledo, Ohio
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
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Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.

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KAW

Write for Money-Saving Prices

Your refinery equipment wants are never too large or too small but what it will pay you to get KAW prices.

We gladly quote on standard equipment or special specification jobs. And assure quick shipment of every order.

1 DURABILITY Only a careful masterly construction can assure durable Bubble Towers. That's why those built by KAW always give more years of low cost service. They have **proved** durable.

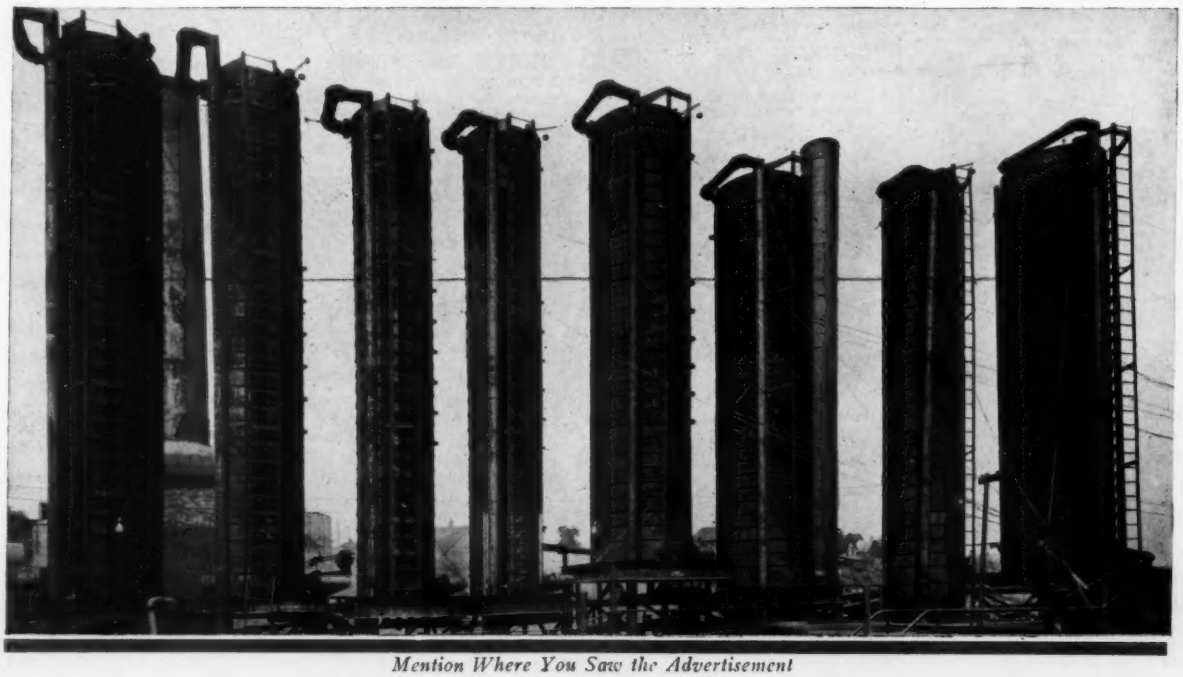
2 ECONOMY Only Bubble Towers that give continuous trouble-free service are economical. That's why so many refineries demand KAW-built Bubble Towers. They have **proved** economical.

3 DEPENDABILITY Only modern equipment and expert workmen can turn out dependable Bubble Towers. The KAW plant has the latest machinery and veteran master craftsmen for producing better-built Bubble Towers that have **proved** dependable in every way.

Kaw Steel Construction Company

General Office and Plant: First and Walker Ave.

KANSAS CITY KANSAS



Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Wilgus Mfg. Co., 1722 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

BURNERS, Electric, Oil

Langstadt-Meyer Co., Appleton, Wis.

BURNERS, Furnace

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
LEE B. METTLER CO., 406 S. Main St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Continental Supply Co., St. Louis, Missouri
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Duquesne Burner Service Co., 5031 Jenkins Arcade Bldg., Pittsburgh, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., 17 Battery Place, New York, N. Y.
Fess System Co., 220 Natoma St. San Francisco, Calif.
John Foerst & Sons, Box 54, Bayonne, N. J.
Fuller-Lehigh Co., Fullerton, Pa.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y.
National Supply Co., Toledo, Ohio
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rue Mfg. Co., 228 Cherry St., Philadelphia, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

BURNERS, Gas

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
B. P. LIENTZ & CO., Kansas City, Mo. See Advertisers' Index.
NATIONAL AIROIL & BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Black, Sivalls & Bryson, Bartlesville, Okla.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Eclipse Fuel Engineering Co., Rockford, Ill.
John Foerst & Sons, Box 54, Bayonne, N. J.
Gas Combustion Co., P. O. Box 1753, Pittsburgh, Pa.
Gilbert & Barker Mfg. Co., Springfield, Mass.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Maxon Premix Burner Co., Muncie, Ind.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

BURNERS, Laboratory

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Griebel Instrument Co., Carbon dale, Pa.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Palo Company, 153 W. 23rd St., New York, N. Y.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.
Tirrill Gas Machine Lighting Co., 50 Church St., New York, N. Y.

BURNERS, Gas and Oil Combined

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
LEE B. METTLER CO., 406 S. Main St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Black, Sivalls & Bryson, Bartlesville, Okla.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Eclipse Fuel Engineering Co., Rockford, Ill.
John Foerst & Sons, Box 54, Bayonne, N. J.
Gas Combustion Co., P. O. Box 1753, Pittsburgh, Pa.
Gilbert & Barker Mfg. Co., Springfield, Mass.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Maxon Premix Burner Co., Muncie, Ind.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

BURNERS, Low Pressure

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
LEE B. METTLER CO., 406 S. Main St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Black, Sivalls & Bryson, Bartlesville, Okla.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Continental Supply Co., St. Louis, Missouri
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., 17 Battery Place, New York, N. Y.
Fess System Co., 220 Natoma St., San Francisco, Calif.
John Foerst & Sons, Box 54, Bayonne, N. J.
Gilbert & Barker Mfg. Co., Springfield, Mass.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Lalor Fuel Oil System Co., Baltimore, Md.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Leiman Bros., 23 Walker St., New York, N. Y.
Maxon Premix Burner Co., Muncie, Ind.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rogers-Higgins Co., Inc., Canal Commercial Bldg., New Orleans, La.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

BURNERS, Oil

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
B. P. LIENTZ & CO., Kansas City, Mo. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Black, Sivalls & Bryson, Bartlesville, Okla.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Briggs Engineering Co., Inc., 219-27 Twenty-Fourth St., Brooklin, N. Y.
Continental Supply Co., St. Louis, Missouri
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Engineer Co., 17 Battery Place, New York, N. Y.
A. B. Farquhar, Co., Ltd., 142 N. Duke St., York, Pa.
Fess System Co., 220 Natoma St., San Francisco, Calif.
John Foerst & Sons, Box 54, Bayonne, N. J.
Gilbert & Barker Mfg. Co., Springfield, Mass.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Lalor Fuel Oil System Co., Baltimore, Md.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Leiman Bros., 23 Walker St., New York, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
MacLeod Company, Cincinnati, Ohio
Maxon Premix Burner Co., Muncie, Ind.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Monarch Mfg. Works, Emery & S. Westmoreland Sts., Philadelphia, Pa.

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TULSA

Sulphuric Acid

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Because our plant is conveniently *located at Tulsa,* and because we give painstaking attention to *every shipment,* buyers of Ozark Sulphuric Acid are assured always of *dependable service.*

Ozark Chemical Company

Manufacturers of All Strengths of Sulphuric Acid

TULSA, OKLAHOMA

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National Supply Co., Toledo, Ohio
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O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Penberthy Injector Co., 340 Holden Ave., Detroit, Mich.
Petroleum Supply Co., Houston, Texas
Wm. Powell Co., Cincinnati, Ohio
W. S. Ray Mfg. Co., Inc., 118 New Montgomery St., San Francisco, Calif.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
Joseph Reid Gas Engine Co., Oil City, Pa.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rogers-Higgins Co., Inc., Canal Commercial Bldg., New Orleans, La.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Sprague Foundry & Mfg. Co., P. O. Box 334, Council Bluffs, Iowa
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

BURNERS, Oil, High Pressure

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Engineer Co., 17 Battery Place, New York, N. Y.
Fess System Co., 220 Natoma St., San Francisco, Calif.
John Foerst & Sons, Box 54, Bayonne, N. J.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Lalor Fuel Oil System Co., Baltimore, Md.
Lamert & Mann Co., Wood & Waknut, Chicago, Ill.
MacLeod Company, Cincinnati, Ohio
McEwen Bros., Wellsville, N. Y.
Monarch Mfg. Works, Emery & S. Westmoreland Sts., Philadelphia, Pa.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Wilgus Mfg. Co., 1732 E. 16th St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

BURNERS, Still

LEE B. METTLER CO., 406 S. Main St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Duquesne Burner Service Co., 5031 Jenkins Arcade Bldg., Pittsburgh, Pa.
Engineer Co., 17 Battery Place, New York, N. Y.
John Foerst & Sons, Box 54, Bayonne, N. J.
Gas Combustion Co., P. O. Box 1753, Pittsburgh, Pa.
George J. Hagan Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
MacLeod Company, Cincinnati, Ohio
Maxon Premix Burner Co., Muncie, Ind.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
Rogers-Higgins Co., Inc., Canal Commercial Bldg., New Orleans, La.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

C

CABINETS

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Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Lyon Metallic Mfg. Co., Aurora, Ill

CALORIMETERS

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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
METRIC METAL WORKS OF AMERICAN METER CO., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Lewis M. Ellison, 214 W. Kinzie St., Chicago, Ill.
Griebel Instrument Co., Carbondale, Pa.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.

CANS

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Brecht Co., 1201 Cass Ave., St. Louis, Mo.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Continental Supply Co., St. Louis, Missouri
Geuder, Paeschke & Frey Co., Western Valley, Milwaukee, Wis.
Moncrief Lenoir Mfg., Co., Houston, Texas
Pittsburgh Plate Glass Co., Pittsburgh, Pa.

CAPS

Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.

CAPS, Bubble

AMERICAN RADIATOR CO., 816-820 S. Michigan Ave., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City. Mo. See Advertisers' Index.
WINKLER & KOCH, 429 First National Bank, Wichita, Kansas. See Advertisers' Index.

CAPS, Outlet

CONLEY TANK CAR CO., Pittsburgh, Pa. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Rogers Foundry & Machine, Joplin, Mo.

CASES, Blow

TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

John Dollinger, Jr., Inc., B x 423, Beaumont, Texas
Frederick Iron & Steel Co., Frederick, Md.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.

CASINGS, Steel Boiler

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

CASTINGS, Aluminum

Robinson Ventilating Co., 517 House Bldg., Pittsburgh, Pa.

CASTINGS, Brass

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Lubricator Co., Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
The Atlas Brass Foundry Co., Columbus, Ohio.
Babcock-Wilcox and Goldie-McCulloch. Ltd., Galt, Ontario, Canada
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
Bethlehem Steel Co., Bethlehem, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Cox Brass Mfg Co., Albany, N. Y.
The Wm. Cramp & Sons Ship & Engine Bldg. Co., Richmond & Norris Sts., Philadelphia, Pa.
DeSoto Foundry & Machinery Co., Mansfield, La.
Dole Valve Co., 1923-33 Carroll Ave., Chicago, Ill.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Julian d'Este Co., 26 Canal St., Boston, Mass.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Hart Co., Inc., Williamsport, Pa.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Ideal Foundry & Machinery Co., Beaver Falls, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Mesta Machine Co., Pittsburgh, Pa.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
Moloch Co., Kaukauna, Wis.
Nute, McGehee, Geary Co., Chambersburg, Pa.
Oil City Boiler Works, Inc., Oil City, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Union Iron Works, Selma, Ala.

CASTINGS, Bronze

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

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A complete service to the Oil Refinery and Manufacturer ✦ Specialties for the Plant ✦ Laboratory Apparatus ✦ Chemicals

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Merco Nordstrom Valve Co.
LUBRICATED PLUG-VALVES

The Brown Instrument Co.
INDICATING AND RECORDING PYROMETERS

Staufer Chemical Co.
SULPHUR

Johns Manville Co.
PACKING AND SPECIALTIES

Hills-McCanna Company
NON-CORROSIVE METAL
POWER PLANT SPECIALTIES

Coors Porcelain Co.
LABORATORY AND INDUSTRIAL PORCELAINS

Ac-Me Company
GAS MEASUREMENT SPECIALTIES

GREENE BROTHERS

WICHITA FALLS, TEXAS

DALLAS, TEXAS

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

The Alcumite Corporation, Dayton, Ohio.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Abrasive Metals Co., 50 Church St., New York, N. Y.
American Lubricator Co., Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
The Atlas Brass Foundry Co., Columbus, Ohio.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
Bethlehem Steel Co., Bethlehem, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Cox Brass Mfg Co., Albany, N. Y.
The Wm. Cramp & Sons Ship & Engine Bldg. Co., Richmond & Norris Sts., Philadelphia, Pa.
Eastwood Wire Mfg. Co., Belleville, N. J.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Julian d'Este Co., 26 Canal St., Boston, Mass.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Frederick Iron & Steel Co., Frederick, Md.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Hart Co., Inc., Williamsport, Pa.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Ideal Foundry & Machinery Co., Beaver Falls, Pa.
Manning, Maxwell & Moore, Inc., New York, N. Y.
Mesta Machine Co., Pittsburgh, Pa.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
Moloch Co., Kaukauna, Wis.
Nute, McGehee, Geary Co., Chambersburg, Pa.
Wm. Powell Co., Cincinnati, Ohio
Richmond Engineering Co., 935 Brook Ave., Box 514, Richmond, Va.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.

CASTINGS, Bubble Deck

Taylor Foundry Co., 1820 Sibley St., Wichita Falls, Texas.

CASTINGS, Bubble Tower

Taylor Foundry Co., 1820 Sibley St., Wichita Falls, Texas.

CASTINGS, Cast Iron

Buffalo Foundry & Machine Co., 41 Winchester Ave., Buffalo, N. Y.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., North Side, Pittsburgh, Pa.

CASTINGS, Copper

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
The Atlas Brass Foundry Co., Columbus, Ohio.
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
The Wm. Cramp & Sons Ship & Engine Bldg. Co., Richmond & Norris Sts., Philadelphia, Pa.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Ideal Foundry & Machinery Co., Beaver Falls, Pa.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.

CASTINGS, Grey Iron

COOPER, C. & G., CO., Mt. Vernon, Ohio. See Advertisers' Index.

The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Nute, McGehee, Geary Co., Chambersburg, Pa.
Reed-Prentice Co., Worcester, Mass.

CASTINGS, Heat Resisting

THE CALORIZING CO., P. O. Box 452, Pittsburgh, Pa. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
OHIO STEEL FOUNDRY CO., Springfield. Ohio. See Advertisers' Index.
WESTERN IRON & SUPPLY CO., Wichita, Kansas. See Advertisers' Index.

American Abrasive Metals Co., 50 Church St., New York, N. Y.
Ashcroft Manufacturing Co., New York, N. Y.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Buffalo Foundry & Machine Co., 41 Winchester Ave., Buffalo, N. Y.
Cyclops Steel Co., Titusville, Pa.
Driver-Harris Co., Harrison, N. J.
Hart Co., Inc., Williamsport, Pa.
Hartwell Iron Works, Houston, Texas
Ideal Foundry & Machinery Co., Beaver Falls, Pa.
Independent Foundry Co., 73 York St., Portland, Ore.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Rosedale Foundry & Machine Co., Columbus and Preble Aves., North Side, Pittsburgh, Pa.

CASTINGS, Iron

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

Hershey Machine & Foundry Co., Manheim, Pa.

CASTINGS, Lead

U. S. Indestructible Gasket Co., 829 E. Fifteenth St., Brooklyn, N. Y.

CASTINGS, Mall-Iron

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
Malleable Iron Fittings Co., Banford, Conn.

CASTINGS, Steel

OHIO STEEL FOUNDRY CO. Springfield, Ohio. See Advertisers' Index.

Allegheny Steel Co., Pittsburgh, Pa.
De Soto Foundry & Machinery Co., Mansfield, La.
The Falk Corporation, Milwaukee, Wisconsin.
Hercules Supply Co., Corsicana, Texas
Malleable Iron Fittings Co., Banford, Conn.
Oklahoma Steel Castings Co., N. Peoria Road, Tulsa, Okla.
Read ng Steel Castings Co., Reading, Pa.

CASTINGS, Semi-Steel

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
Nute, McGehee, Geary Co., Chambersburg, Pa.

CASTINGS, Tank Car

AMERICAN CAR AND FOUNDRY CO., 165 Broadway, New York, N. Y. See Advertisers' Index.
GENERAL AMERICAN TANK CAR CORP., 940 Illinois Mercantile Bank Bldg., Chicago, Ill. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge, Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., 351 California St., San Francisco, Calif.
DeSoto Foundry & Machine Co., Mansfield, La.
Erie City Iron Works, Erie, Pa.
The Falk Corporation, Milwaukee, Wisconsin.
Greenlee Foundry Co., 662 W. Roosevelt Rd., Chicago, Ill.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
Ideal Foundry & Machinery Co., Beaver Falls, Pa.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Mesta Machine Co., Pittsburgh, Pa.
National Malleable & Steel Castings Co., Cleveland, Ohio.
Oklahoma Steel Castings Co., N. Peoria Road, Tulsa, Okla.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Sivyer Steel Castings Company, Milwaukee, Wis.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

CASTINGS, White Iron

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.

CAST IRON, Low Heat

Plouff Co., 170 Summer St., Boston, Mass.

CEMENT, Acid Proof

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
Q IGLEY F RNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
International Compositions Co., 25 Broadway, New York City, N. Y.
Rogers Asbestos Co., Houston, Texas.

CEMENT, Asbestos

JOHNS-MANVILLE INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acme Asbestos Covering & Supply Co., 242 N. Elizabeth St., Chicago, Ill.
Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio.
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
R. V. Aycock Co., Kansas City, Mo.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
Continental Products Co., Euclid, Ohio
The Darcoid Co., 55 Warren St., New York, N. Y.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
Federal Process Co., Cleveland, Ohio.
The Hays Corporation, Michigan City, Ind.
Keasbey & Mattison Co., Ambler, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
King Refractories Co., Inc., 1709 Niagara St., Buffalo, N. Y.
National Supply Co., Toledo. Ohio
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Norristown Mangesia & Asbestos Co., Norristown, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philip Carey Co., Cincinnati, Ohio
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rogers Asbestos Co., Houston, Texas.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

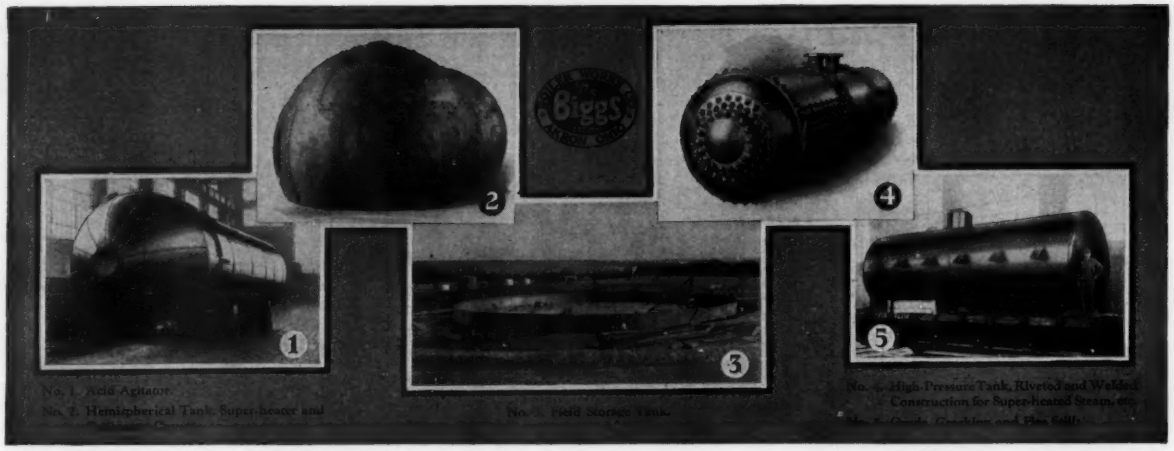
CEMENT, Boiler Setting

COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.

CEMENT, Fire Brick

BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
CELITE PRODUCTS CO., Van Nuys Bldg., Los Angeles, Calif. See Advertisers' Index.
PLIBRICO JOINTLESS FIRE BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SEPCIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acme Brick Co., Ft. Worth, Texas
American Chimney Corp., 147 Fourth Ave., New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Betson-Jewell, Inc., Rome, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Crescent Refractories Co., Curwensville, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
Harbison Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.



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No. 2. Hemispherical Tank, Super-heater and
No. 3. Field Storage Tank.
No. 4. High-Pressure Tank, Riveted and Welded Construction for Super-heated Steam, etc.
No. 5. For Crude, Gasoline and Pine Stills.

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Queens Run Refractories Co., Inc., W. Water St., Lock Haven, Pa.
Rogers Asbestos Co., Houston, Texas.
Southern Refractories Co., Fort Payne, Alabama.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
United States Refractories Corp'n., Mount Union, Pa.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
Wellsville Fire Brick Co., Wellsville, Mo.

CEMENT, High Temperature

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BANNER ROCK PRODUCTS CO., Alexandria, Ind. See Advertisers' Index.
BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
CELITE PRODUCTS CO., 1320 South Hope St., Los Angeles, Calif. See Advertisers' Index.
JOHNS-MANVILLE, INC., Madison Ave. at 41st St., New York, N. Y. See Advertisers' Index.
PLIBRICO JOINTLESS FIRE BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WARD CHEMICAL COMPANY 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acme Brick Co., Ft. Worth, Texas
American Chimney Corp., 147 Fourth Ave., New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Bernitz Furnace Appliance Co., 80 Federal St., Boston, Mass.
Betson-Jewell, Inc., Rome, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Crescent Refractories Co., Curwensville, Pa.
The Denver Fire Clay Co., P. O. Box 1107, Denver, Colorado.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
James Gardner, Jr., Co., Ebensburg, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh, Pa.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
King Refractories Co., Inc., 1709 Niagara St., Buffalo, N. Y.
McLeod & Henry Co., Troy, N. Y.
National Supply Co., Toledo, Ohio
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Philip Carey Co., Cincinnati, Ohio
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Queens Run Refractories Co., Inc., W. Water St., Lock Haven, Pa.
Rogers Asbestos Co., Houston, Texas.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.
Wellsville Fire Brick Co., Wellsville, Mo.

CEMENT, Leather Belting

Chicago Belting Co., 125 N. Green, Chicago, Ill.
The Eagle Counter & Leather Co., 414 E. Eighth St., Cincinnati, O.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Hudson Belting Co., 1-3 Easton Place, Worcester, Mass.
Edward R. Ladew Co., 29 Murray St., New York, N Y.
Lawrence Belting Co., Inc., 113 Chambers St., New York, N. Y.
McCauley Belting Co., 412-430 Orleans St., Chicago, Ill.
Milwaukee Leather Belting Co., 352 E. Water St., Milwaukee, Wis.
Missouri Belting Co., 1021-1029 S. Grand Ave., St. Louis, Mo.
National Supply Co., Toledo, Ohio
Norwich Belt Mfg. Co., Inc., Norwich, Conn.
The N. Palmer Belting Co., Bridgeport, Conn.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Texas Belting Co., Houston, Texas.
J. S. Turner Mfg. Co., 133 Middle St., P. O. Box 1072, Lowell, Mass.
Union Belt Co., 66 Troy St., Fall River, Mass.
Union Iron Works, Selma, Ala.
Warren Belting Co., 33 Artic St., Worcester, Mass.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.
Western Rawhide & Belting Co., 901-35 Winnebago St., Milwaukee, Wis.
I. B. Williams & Sons, 9 Orchard St., Dover, N. H.

CEMENT, Magnesia

Ehrot Magnesia Mfg. Co., Valley Forge, Pa.

CEMENT, Pipe Line

Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.

CEMENTS, Refractory

LACLEDE-CHRISTY, St. Louis, Mo. See Advertisers' Index.

Southern Refractories Co., Fort Payne, Alabama.

CEMENT, Roofing

Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.

CEMENT, Rubber

Diamond Rubber Co., Inc., Akron, Ohio.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.

CEMENT, Tank Repair

Federal Process Co., Cleveland, Ohio.

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BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
DE LAVAL SEPARATOR CO., 165 Broadway, New York, N. Y. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Frank S. Betz Co., Hammond, Ind.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
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Tolhurst Machine Works, Troy, New York.

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Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Malleable & Steel Castings Co. Cleveland, Ohio.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
U. S. Chain & Forging Co., Union Trust Bldg., Pittsburgh, Pa.

CHARCOAL, Activated

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

CHARCOAL, Gasoline Plant

GASOLINE RECOVERY CORP., Peoples Bank Bldg., Charleston, W. Va. See Advertisers' Index.

CHILLERS, Distillate

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

CHIMNEYS, Concrete

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.

CHISEL BLANKS

Brazelton, Wessendorff & Nelms, Houston, Texas.
May Machinery Co., Second National Bank Bldg., Houston, Tex.

CIRCUIT CLOSERS, Electrical and Mechanical

Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.

CLAMPS, Belt

Federal Supply Co., Grant Bldg., Fort Worth, Texas.
Victor Balata & Textile Belting Co., 38 Murray St., New York, N. Y.

CLAMPS, Collar Leak

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

CLAMPS, Hose

Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, Ohio.

CLAMPS, Pipe

NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge, Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
Equitable Equipment Co., Inc., New Orleans, La.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
H. Mueller Mfg Co., Decatur, Ill.
National Supply Co., Toledo, Ohio
F. A. Nusbaum, 125 William St., Lockland, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Perfection Leak Closing Clamp Mfgs., 125 William St., Lockland, Ohio.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

CLAMPS, Pipe Joint

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

CLAMPS, Pipe Line

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

CLARIFIERS, Gasoline

DE LAVAL SEPARATOR CO., 165 Broadway, New York, N. Y. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Hardinge Co., Inc., York, Pa.
Oliver Continuous Filter Co., Oakland, Calif.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
T. Shriver & Co., 844 Hamilton St., Harrison, N. J.

CLAY, Bleaching

WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Filtrol Company, 215 West 7th St., Los Angeles, Calif.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.

CLAY, Diaspore

T. K. Harris, Polytechnic Station, Fort Worth, Texas.

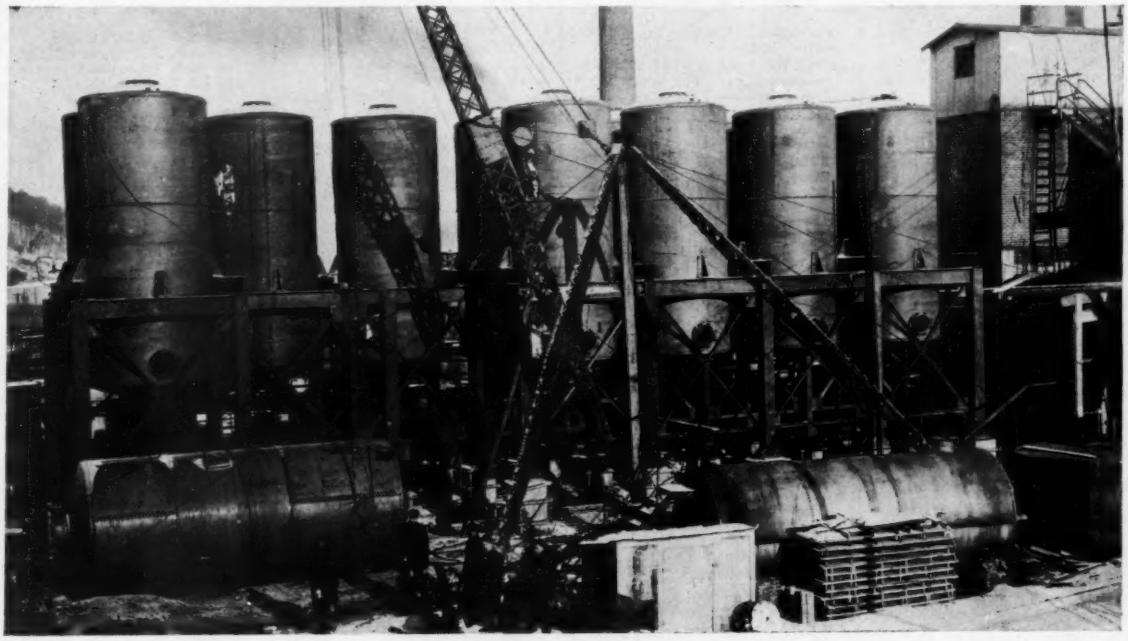
CLAYS, Filtering

Filtrol Company, 215 West 7th St., Los Angeles, Calif.

CLAY, Fire

BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
LACLEDE-CHRISTY, St. Louis, Mo. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acme Brick Co., Ft. Worth, Texas
American Gas Construction Co., Newton, Iowa
Betson-Jewell, Inc., Rome, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Cresent Refractories Co., Curwensville, Pa.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Elgin Butler Brick & Tile Co., Austin, Texas



Hammond Filters with Fulton Patented Heads with Removable Non-Corrosive Monel Metal Screen. A Labor Saver doing away with old fashioned methods. Made in Diameters 5 to 10 feet and heights 10 x 30 feet. Names of users on request.

Our Bulletin No. 300 describes these Filters.

Our Bulletin No. 200 covers storage tanks from 300 to 80,000 barrels, and Bulletin No. 100R covers Horizontal Tanks from 1600 to 24,000 gallons. We make a specialty of furnishing steel tanks knocked down for domestic or export.

Erection men always available.

HAMMOND IRON WORKS

WARREN, PA.

Manufacturers and Exporters of Steel Tanks and Steel Plate Construction

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A. P. Green Fire Brick Co., Mexico, Mo.
Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh, Pa.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
Heine Boiler Co., St. Louis, Mo.
Houston Implement Co., Houston, Texas.
The Kier Fire Brick Co., 1844 Oliver Bldg., Pittsburgh, Pa.
Louisville Fire Brick Works, Inc., 4554 Louisville Ave., Louisville, Ky.
McLeod & Henry Co., Troy, N. Y.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Queens Run Refractories Co., Inc., W. Water St., Lock Haven, Pa.
Southern Refractories Co., Fort Payne, Alabama.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
Wellsville Fire Brick Co., Wellsville, Mo.

CLEANERS, Boiler Tube

ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
THE LAGONDA MFG. CO., Springfield, Ohio. See Advertisers' Index.
LIBERTY MFG. COMPANY, Jeannette, Pa. See Advertisers' Index.
THE ROTO CO., Sussex Ave. and Newark St., Newark, N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.
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Continental Supply Co., St. Louis, Missouri
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
General Specialty Co., 61-69 Carroll St., Buffalo, N. Y.
Hampton Paint & Chemical Co., Springfield, Mass.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jarecki Mfg. Co., Erie, Pa.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pangborn Corp., Hagerstown, Md.
Wm. B. Pierce Co., 45 N. Division St., Buffalo, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Reiter Co., 259 N. St., Elgin, Ill.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., North Side, Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
The Stanwood Corp., Cincinnati, O.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Union Iron Works, Selma, Ala

CLEANERS, Flue

ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
LAGONDA MFG. COMPANY Springfield, Ohio. See Advertisers' Index.
LIBERTY MFG. COMPANY, Jeannette, Pa. See Advertisers' Index.
THE ROTO CO., Sussex Ave. and Newark St., Newark, N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Babcock-Wilcox and Goldie-McCulloch, Ltd, Galt, Ontario, Can.
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
John Dollinger, Jr., Inc., Box 423 Beaumont, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville Ind.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa
Milwaukee Steam Appliance Co., West Allis, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, O.
Oil Well Supply Co., Pittsburgh, Pa.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Wm. B. Pierce Co., 45 N. Division St., Buffalo, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Reiter Co., 259 North St., Elgin, Ill.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Iron & Steel Co., Chicago, Ill.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
The Stanwood Corp., Cincinnati, O.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Union Iron Works, Selma, Ala.

CLEANERS, Gas

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.

CLEANESS, Still Tube

ELLIOTT COMPANY, Jeanette, Pa. See Advertisers' Index.
LAGONDA MFG. COMPANY Springfield, Ohio. See Advertisers' Index.
LIBERTY MFG. COMPANY, Jeannette, Pa. See Advertisers' Index.
THE ROTO CO., Sussex Ave. and Newark St., Newark, N. J. See Advertisers' Index.

Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Pangborn Corp., Hagerstown, Md.
Plouff Co., 170 Summer St., Boston, Mass.

CLOCKS, Engine Room

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

CLOCKS, Time

New York Machinery Co., 200 Fifth Ave., New York, N. Y.

CLOCKS, Watchman

Chicago Watchman's Clock Co., 1526 S. Wabash Ave., Chicago, Ill.
Petroleum Supply Co., Houston, Texas

CLOTH, Blueprint

Spaulding-Moss Co., 42 Franklin St., Boston, Mass.

CLOTH, Metallic Filter

U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Newark Wire Cloth Co., 351 Verona Ave., Newark, N. Y.
Wickwire-Spencer Steel Co., 41 E. Forty-Second St., New York, N. Y.

CLOTH, Tracing

Spaulding-Moss Co., 42 Franklin St., Boston, Mass.

CLOTH, Wire

THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Eastwood Wire Mfg. Co., Belleville, N. J.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Newark Wire Cloth Co., 351 Verona Ave., Newark, N. Y.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Wickwire-Spencer Steel Co., 41 E. Forty-Second St., New York, N. Y.

CLUTCHES, Friction

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Southern Engine & Pump Co., Houston, Texas
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.
T. B. Wood's Sons Co., Chambersburg, Pa.

CLUTCHES, Reverse

THE BESSEMER GAS ENGINE Co., Grove City, Pa. See Advertisers' Index.

A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Southern Engine & Pump Co., Houston, Texas

COATINGS, Chemical

Metals Coating Company of America, 495-97 N. Third St., Philadelphia, Pa.

COATING, Metal

Metals Coating Company of America, 495-97 N. Third St., Philadelphia, Pa.

COCKS, Air

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MERCO NORDSTROM VALVE CO., Houston, Texas. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Allen & Billmyre Co., Inc., Grand Central Palace, New York City, N. Y.
American Lubricator Co., Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
Bashlin Co., Warren, Pa.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Brunner Mfg. Co., Utica, N. Y.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
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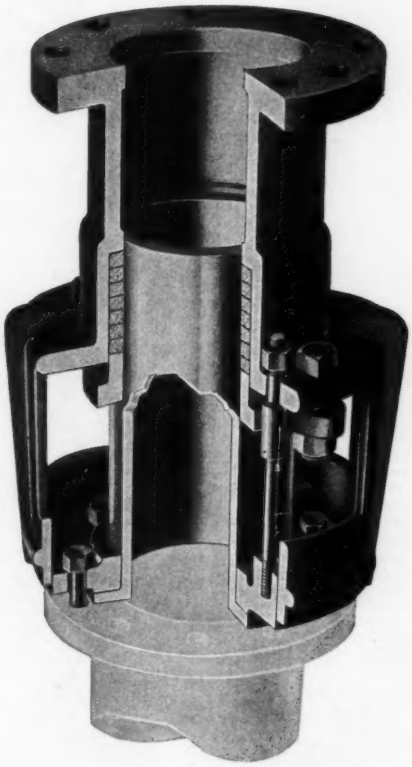
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jarecki Mfg. Co., Erie, Pa.
Judson Governor Co., Rochester, New York.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
Manning Maxwell & Moore, Inc., New York, N. Y.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Fuel Engineering Co., 667-687 Post Ave., South Detroit, Mich.
Union Iron Works, Selma, Ala.

COCKS, Drain

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
HILLS-McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.



This Expansion Joint is operating on 200 lbs. working oil pressure and 900 degrees of heat.

27 of them were installed in October, 1923, in residuum rundown lines on Dubbs Stills. The operator recently said, "We do not know we have them in the lines."

The same Company have recently placed their order with us for 72 more to operate on the same service:

200 lbs. working pressure and 900 degrees of heat.

Ross Expansion Joints have proven they are the most satisfactory under severe conditions.

Why not ask the men who use them.

Ross Heater & Mfg. Co.

BUFFALO, N. Y.

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H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
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Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Dole Valve Co., 1923-33 Carroll Ave., Chicago, Ill.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Judson Governor Co., Rochester, New York.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Union Iron Works, Selma, Ala.

COCKS, Gas

Geo. D. Roper Corp., Rockford, Ill.

COCKS, Gauge

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
SMITH SEPARATOR COMPANY, Tulsa, Oklahoma. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
James Bonar & Co., Park Bldg., Pittsburgh, Pa.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
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Carbondale Machine Co., Carbondale, Pa.
Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.
Continental Supply Co., St. Louis, Missouri
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
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Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
Manning Maxwell & Moore, Inc., New York, N. Y.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
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National Supply Co., Toledo, Ohio
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Oil Well Supply Co., Pittsburgh, Pa.
Petroleum Supply Co., Houston, Texas
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Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.
Rich Mfg. Co., 370 Atlantic Ave., Boston, Mass.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
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John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
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United States Gauge Co., 44 Beaver St., New York, N. Y.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

COCKS, Gland Packed

H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.

COCKS, Hard Lead

United Lead Co., 111 Broadway, New York, N. Y.

COCKS, Indicator

Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.

COCKS, Oil

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
Atlas Valve Co., 282 South St., Newark, N. J.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Judson Governor Co., Rochester, New York.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.

COCKS, Plug

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
MERCO NORDSTROM VALVE CO., Houston, Texas. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati. Ohio. See Advertisers' Index.

The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
Eastwood Wire Mfg. Co., Belleville, N. J.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Judson Governor Co., Rochester, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Union Water Meter Co., Worcester, Mass.

COCKS, Roundway

H. Belfield Co., 435 N. Broad St. Philadelphia, Pa.

COCKS, Steam Stop

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MERCO NORDSTROM VALVE CO., Houston, Texas. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati. Ohio. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Judson Governor Co., Rochester, New York.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Union Iron Works, Selma, Ala.

COCKS, Steam Stop Asbestos Packed

Reading Steel Castings Co., Reading, Pa.

COCKS, Three - Way and Four-Way

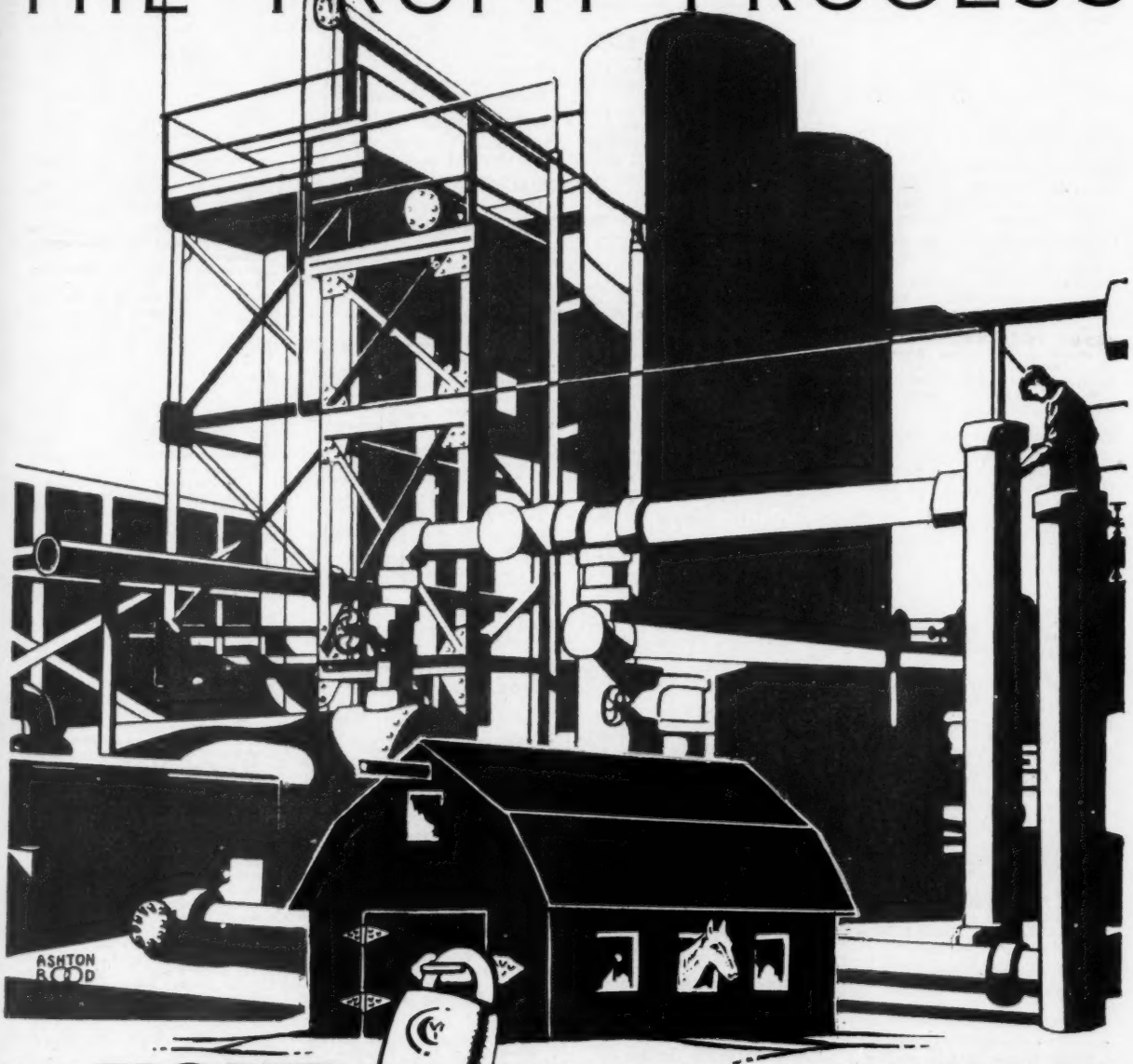
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.

COILS

E. B. BADGER & SONS CO., 62-75 Pitts St., Boston, Mass. See Adertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
THE VILTER MFG. CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Albright's Son & Co., Allentown, Pa.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Carbondale Machine Co., Carbondale, Pa.
Finucane Boiler Works, Houston, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
International Heater Co., 101 Park Ave. Utica, N. Y.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Milwaukee Steam Appliance Co., West Allis, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Roessing Mfg. Company, Sharpsburg Station, Pittsburgh, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Standard Tank Car Co., Sharon, Pa.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Whitlock Coil Pipe Co., Hartford, Conn.
York Products Corporation, Houston, Texas.

THE PROFIT PROCESS



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Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.

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United Lead Co., 111 Broadway, New York, N. Y.

COILS, Oil Cracking

MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Loiusville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers Index.

Finucane Boiler Works, Houston, Texas.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.

COLLARS

The Acme Tank Car Co., Coffeyville, Kansas
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Union Works, Selma, Ala.

COLLARS, Tank Shell

OIL CONSERVATION ENGINEERING CO., Cleeland, Ohio. See Adertisers' Index.

COLORIMETERS

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Denver Fire Clay Co., 1742-46 Champa, Denver, Colo.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Palo Company, 153 W. 23rd St., New York, N. Y.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.

COLUMNS, Packed

WINKLER & KOCH, 429 First National Bank, Wichita, Kansas. See Advertisers' Index.

Fort Worth Steel & Machinery Co., Fort Worth, Texas

COLUMNS, Water

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
HILLS-McCANNA Co., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Coale Muffler & Safety Valve Co., 325-335 E. Oliver St., Baltimore, Md.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
The Dyer Mfg. Co., 155 Brookline St., Cambridge, Mass.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 20-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, O.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
The Stanwood Corp., Cincinnati, O.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Union Iron Works, Selma, Ala.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

COMPASSES

The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.

COMPENSATORS, Automatic

ELECTRIC CONTROLLER & MFG. CO., 2700 E. Seventy-Ninth St., Cleveland, Ohio.

COMPOUNDS

Brazelton, Wessendorff & Nelms, Houston, Texas.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.

COMPOUNDS, Boiler

BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Arrow Boiler Compound Co., 3929 Olive St., St. Louis, Mo.
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Binghamton Boiler Compound Co., Binghamton, N. Y.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
Dearborn Chemical Co., 323 S. Michigan Ave., Chicago, Ill.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Hawk-Eye Compound Co., Blue Island, Suburb of Chicago, Ill.
W. B. McVicker Co., 295 Douglass St., Brooklyn, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Reiter Co., 259 N. St., Elgin, Ill.
Union Iron Works, Selma, Ala.
Unisol Mfg. Co., 17 Howard Place, Jersey City, N. J.
Thos. C. Warley & Co., 211-217 Bainbridge St., Philadelphia, Pa.

COMPOUNDS, Pipe Joints

The Eclipse Paint & Mfg. Co., Cleveland, Ohio.

COMPOUNDS, Rust Inhibitive

OAKITE PRODUCTS, INC., 2 Thames St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
The Dampney Co. of America, 50-60 Business St., Boston, Mass.
Dearborn Chemical Co., 310 S. Michigan Ave., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Petroleum Supply Co., Houston, Texas
Reiter Co., 259 N. St., Elgin, Ill.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.
Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.
Thos. C. Warley & Co., 211-217 Bainbridge St., Philadelphia, Pa.

COMPRESSOR PLANTS

FLUOR CONSTRUCTION CO., 909 East 59th St., Los Angeles, Calif. See Advertisers' Index.

COMPRESSORS, Air

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
CLARK BROS. CO., Olean, N. Y. See Advertisers' Index.
COOPER, C. & G., CO., Mt. Vernon, Ohio. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers, Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge, Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Allen & Billmyre Co., Inc., Grand Central Palace, New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Steam Pump Co., Battle Creek, Mich.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Beach-Russ Co., 30 Church St., New York, N. Y.
Binks Spray Equipment Co., 3114 Carroll Ave., Chicago, Ill.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Brunner Mfg. Co., Utica, N. Y.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Charter Gas Engine Co., Sterling, Illinois.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Thos. H. Dallett Co., 165-89 Clearfield, St., Philadelphia, Pa.
De Vilbiss Mfg. Co., Toledo, Ohio
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Domestic Engine & Pump Co., Shippensburg, Pa.
Frank J. Dyett Co., 73 John St., Illion, N. Y.
Equitable Equipment Co., Inc., New Orleans, La.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
R. B. Everett Co., Houston, Texas
Gardner-Governor Co., Quincy, Ill.
F. W. Gartner Co., Houston, Texas.
General Electric Co., Schenectady, New York
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Lucas Pump & Tool Co., 427 Valley St., Dayton, Ohio
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Mesta Machine Co., Pittsburgh, Pa.
Miller Improved Gas Engine Co., Springfield, Ohio.
National Supply Co., Toledo, Ohio
Nordberg Mfg. Co., Milwaukee, Wis.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Oliver Continuous Filter Co., Oakland, Calif.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
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Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.
Superior Gas Engine Co., Springfield, Ohio
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Union Steam Pump Co., Battle Creek, Mich.
Western Gas Construction Co., Fort Wayne, Ind.
Western Machinery Co., Los Angeles, Calif.
Wittenmeier Machinery Co., 852 N. Spaulding Ave., Chicago, Ill.

COMPRESSORS, Air, Portable

Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.

COMPRESSORS, Ammonia

COOPER, C. & G., CO., Mt Vernon, Ohio. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
THE VILTER MFG. CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
YORK MANUFACTURING CO., York Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.

American Engineering Co., Philadelphia, Pa.
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Arctic Ice Machine Co., Canton, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Bayley Mfg. Co., 73 Greenbush St., Milwaukee, Wis.
Beach-Russ Co., 30 Church St., New York, N. Y.
Carbondale Machine Co., Carbondale, Pa.
Crowell Mfg. Co., 315 Franklin Ave Brooklyn, N. Y.
Frick Co., Inc., Waynesboro, Pa.
Gardner-Governor Co., Quincy, Ill.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Milwaukee Steam Appliance Co., West Allis, Wis.
Southern Engine & Pump Co., Houston, Texas
Tennant Co., Union National Bank Bldg., Houston, Texas.
York Products Corporation, Houston, Texas.

COMPRESSORS, Centrifugal

THE C. & G. COOPER CO., Mount Vernon, Ohio. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.

Allen & Billmyre Co., Inc., Grand Central Palace, New York City, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Gardner-Governor Co., Quincy, Ill.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
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Southern Engine & Pump Co., Houston, Texas
Spencer Turbine Company, Hartford, Conn.
Tennant Co., Union National Bank Bldg., Houston, Texas.

COMPRESSORS, Gas

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
CLARK BROS. CO., Olean, N. Y. See Advertisers' Index.
COOPER, C. & G., CO., Mt Vernon, Ohio. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.
HOPE ENGINEERING & SUPPLY CO., Mt. Vernon, Ohio. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Allen & Billmyre Co., Inc., Grand Central Palace, New York City, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Gas Construction Co., Newton, Iowa
Arctic Ice Machine Co., Canton, Ohio
Bates Manufacturing Co., 710 Henderson Ave., Joliet, Ill.
Beach-Russ Co., 30 Church St., New York, N. Y.
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Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Equitable Equipment Co., Inc., New Orleans, La.
Frick Co., Inc., Waynesboro, Pa.
Gardner-Governor Co., Quincy, Ill.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
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Mesta Machine Co., Pittsburgh, Pa.
Miller Improved Gas Engine Co., Springfield, Ohio.
Nordberg Mfg. Co., Milwaukee, Wis.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
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Pattin Bros. Co., Marietta, Ohio.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Superior Gas Engine Co., Springfield, Ohio
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
Union Steam Pump Co., Battle Creek, Mich.
Western Gas Construction Co., Fort Wayne, Ind.

COMPRESSORS, Gasoline Extraction

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
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COOPER, C. & G., Co. Mt. Vernon, Ohio. See Advertisers' Index.
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HOPE ENGINEERING & SUPPLY CO., Mount Vernon, Ohio. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Arctic Ice Machine Co., Canton. Ohio
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Gardner-Governor Co., Quincy, Ill.
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Miller Improved Gas Engine Co., Springfield, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Sullivan Machinery Co., 122 S Michigan Ave., Chicago, Ill.
Superior Gas Engine Co., Springfield, Ohio
Union Steam Pump Co., Battle Creek, Mich.

COMPRESSORS, Portable

CLARK BROS. CO., Olean, N. Y. See Advertisers' Index.

COMPRESSORS, Rotary

Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.

COMPRESSORS, Steam

SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.

CONCENTRATORS, Sludge Acid

Geo. F. Hart Engineering Corp., 52 Vanderbilt Ave., New York, N. Y.

CONCRETE, Mixers

The Lakewood Engineering Co., Cleveland, Ohio

CONDENSERS

AMERICAN RADIATOR CO., 816-820 S. Michigan Ave., Chicago, Ill. See Advertisers' Index.
BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GASOLINE RECOVERY CORP., Peoples Bank Bldg., Charleston. W. Va. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINE-CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Gas Construction Co., Newton, Iowa
American Iron Works, Inc., Louisville, Ky.
American Steam Pump Co., Battle Creek, Mich.
Arctic Ice Machine Co., Canton, Ohio
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Beach-Russ Co., 30 Church St., New York, N. Y.
Biggs Boiler Works Co., Case Ave. and Newton St., Akron, Ohio
Bousman Mfg. Co., Inc., 1153-57 Plainfield Ave., N. E., Grand Rapids, Mich.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Carbondale Machine Co., Carbondale, Pa.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Frick Co., Inc., Waynesboro, Pa
Hardie-Tynes Mfg. Co., Eighth Ave., & Twenty-Eighth St., Birmingham, Ala.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Glass Co., Alton, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
Mesta Machine Co., Pittsburgh, Pa.
Milwaukee Steam Appliance Co., West Allis, Wis.
New York Engineering Co., 2 Rector St., New York, N. Y.
Petroleum Iron Works, Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Titusville Iron Works, Titusville, Pa.
Treadwell Construction Co., Midland, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Western Gas Construction Co., Fort Wayne, Ind.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Whitlock Coil Pipe Co., Hartford, Conn.
Wittenmeier Machinery Co., 852 N. Spaulding Ave., Chicago, Ill.

CONDENSERS, Ammonia

THE VILTER MANUFACTURING CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.

Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.

CONDENSERS, Charcoal Gasoline Plant

GASOLINE RECOVERY CORP., Peoples Bank Bldg., Charleston, W. Va. See Advertisers' Index.

CONDUITS, Electric

JOHNS-MANVILLE INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.

Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
American Tube & Pipe Bending Co., Niles, Ohio
Eastern Tube & Tool Co., Inc., 594 Johnson Ave., Brooklyn, N. Y.
Garland Mfg. Co., 1709 First Nat. Bank Bldg., Pittsburgh, Pa.
General Electric Co., Schenectady, New York
Langstadt-Meyer Co., Appleton, Wis.
The Pyle-National Co., 1334 N. Kostner Ave., Chicago, Ill.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

CONDUITS, Underground

JOHNS-MANVILLE INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.

American District Steam Co., N. Tonawanda, N. Y.
General Electric Co., Schenectady, New York
Langstadt-Meyer Co., Appleton, Wis.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.

CONSISTOMETERS, Grease Testing

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Humbolt Mfg Co., 2014 Nebraska Ave., Chicago, Ill.

CONTACTORS, Belt

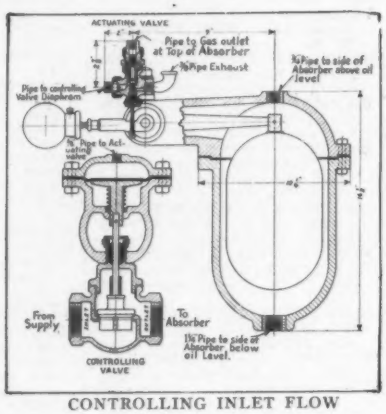
T. B. Wood's Sons Co., Chambersburg, Pa.

CONTROLS, Automatic Refrigerating Machinery

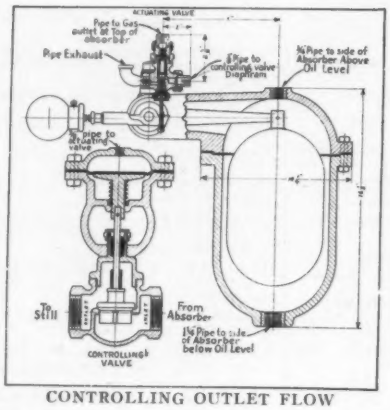
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.

SALES and SERVICE

WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL



CONTROLLING INLET FLOW



CONTROLLING OUTLET FLOW

VIGILANT OIL LEVEL REGULATORS

For remote control of the oil supply in Absorber Tanks—

In the process of the manufacture of gasoline by absorbing the gasoline in oil and subsequently separating the gasoline from the oil by distillation, it is necessary to maintain a constant oil level in both the absorbing tank and the still.

All of the new features embodied in the Vigilant Feed Water Regulator, which we invented and placed on the market thirty years ago, are to be found in the Vigilant Oil Level Regulator.

The Vigilant Oil Level Regulator is usually constructed to control the outlet flow of oil from an absorber. When so constructed the controlling valve is placed in the oil discharge line from the absorber. By placing the actuating valve on the opposite side of the fulcrum the regulator will control the inlet flow of oil to the absorber and the controlling valve is placed in the inlet oil line to the absorber.

THE CHAPLIN-FULTON MANUFACTURING COMPANY

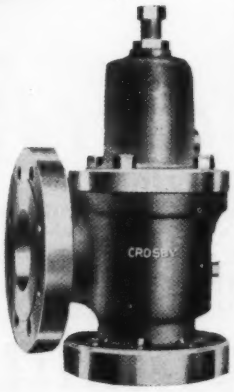
Pittsburgh, Penn.

Westcott & Greis, Inc.

MEASUREMENT AND CONTROL

SALES and SERVICE

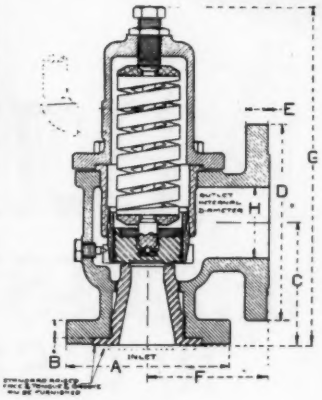
WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL



CROSBY

Relief Valve

Style JJ



This is a valve for extreme service for use under high pressures and temperatures and where very high capacity is required.

This valve has a nozzle throat tube and the guides are above the disc. This design not only insures the maximum obtainable discharge capacity (approximately 98% of the theoretical discharge of the orifice), but the "sticking" of the disc, due to the guides adhering to the seat from sediment, deposits (such as coking) or difference in expansion, is avoided.

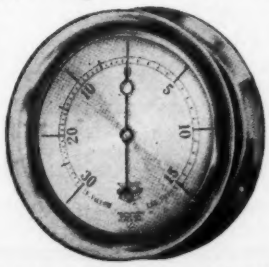
The valve is mounted with a special hard alloy steel, unequalled for its resistance to erosion, corrosion and high temperature.

Extensively used on oil lines, hot and cold, and on pressure stills and cracking coils.

Send for special catalogues and prices. Please state service required.

Crosby Compound Pressure and Vacuum Gage

The Crosby Compound Pressure and Vacuum Gage, style AAX, is a precisely machined, carefully made instrument. Carefully calibrated, in dial sizes from 3½ to 12 inches, with non-liminous dial, wide graduations plainly marked, and easily read.



In quantities of 25 or more, company name is supplied on dial, free. The Crosby Company manufactures a complete line of test, altitude and hydraulic gauges for pressures to 15,000 pounds, regular, and above, on special order. Write for completely descriptive catalog.

CROSBY STEAM GAGE & VALVE COMPANY, Boston, Mass.

Westcott & Greis, Inc.

MEASUREMENT AND CONTROL

SALES and SERVICE

WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL

Nearly a Qu

of SALES and Service has reduc to a simple formula:

THE PETROLEUM APPLIANCE CO. (THE MASTER MIXER HEAD)
CROSBY STEAM GAUGES AND VALVES

LIQUID SAFETY VALVES and companion line of safety tank equipment.

WESTCOTT ORIFICE METERS.

METRIC IRONCASE METERS.

DAVIS SUPERSENSITIVE RELIEF VALVE AND CASING HEAD REGULATORS.

CHAPLIN-FULTON high and low pressure regulators.

MERIAM MANOMETERS and companion line of Meriam Products.

MacDONALD 2Lt. 3 Diaphragm Meters equipped with 4 purging cocks for laboratory and charcoal testing.

BRISTOL'S CHARTS AND RECORDING GAUGES.

KREB'S LEVELING SADDLES.

Westcott & Greis, Inc.
MEASUREMENT AND CONTROL

SALES and SERVICE

WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL

arter-Century
ed MEASUREMENT and CONTROL
"Ask Westcott and Greis"

Since 1904 a service has been shaping itself to meet the growing demands of the Oil Industry. For almost twenty-five years, technical questions—plans and problems—relating to Measurement and Control of gases, water, oil and steam in the gas, natural gasoline, refining and producing divisions, have been multiplying and intensifying. During these years Westcott and Greis, Inc., has stepped off each milestone of progress side by side with the Industry.

A staff of able technical advisors, unlimited facilities, ample stock strategically located, insure those in search of installation counsel or practical methods for meeting their measuring and controlling problems, a speedy and economical service that never fails of results, though the situation to be faced be one without precedent.

So faultless and dependable has this service become, in the sales and service of the MEASUREMENT AND CONTROL devices listed on the opposite page, that those whose work lies in keeping accurate check and control of steam and liquids, as well as those who are responsible for the economy and production of plant and lease operation, regard Westcott and Greis as a tangible asset in making their work easier and more profitable.

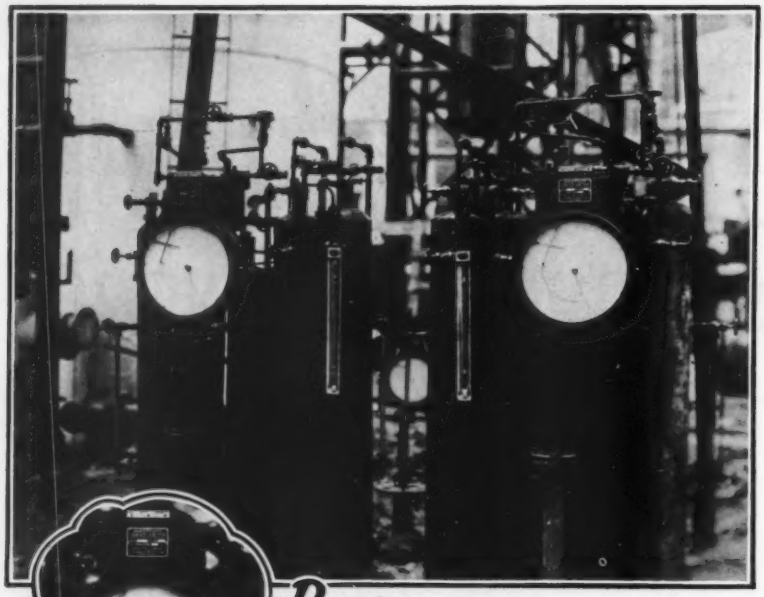
This growing tendency on the part of field and office men to take advantage of Westcott and Greis' quarter-century of experience has established a simple formula which can be applied to your own problems with equal efficacy: "Ask Westcott and Greis."

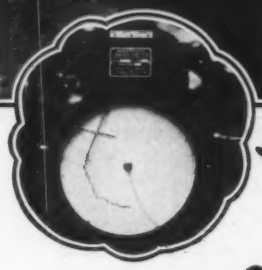
Dallas — TULSA — Los Angeles

Westcott & Greis, Inc.
MEASUREMENT AND CONTROL

SALES and SERVICE

WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL





Between PUMPS AND ABSORBERS-
Accuracy.

Exact records of various refinery operations are more in demand

Metric orifice meters are giving refiners eyes that they may see and records that they may know.

Every modern refining process is capable of checking by orifice meter. And a fair share of the progress from better methods and better results is creditable to these little instruments that have replaced darkness and guess work by vision and accuracy.

The refineries that are setting the pace in progressive practices are developing closer means of checking each step. Since the orifice meter is the most adaptable measuring device for such work, their installation is multiplied by the new uses for which they are constantly being requisitioned.

This view of two orifice meters illustrates a particularly popular use. The installation is at the West Coast Refining Company, Placentia, California. It shows their method of securing accurate determinations of the oil pumped to absorbers. Although the use of the cylinders is unique the application of the orifice meter to this particular service is typical of the more important refineries.

From the start to finish, orifice meters are established in refineries on their merit for accuracy, adaptability, ease of operation and complete dependability.

Have you been overlooking opportunities where they can help?

METRIC METAL WORKS
of the American Meter Company, Inc.
·ERIE·PENNSYLVANIA·U·S·A·

METRIC orifice METERS

—for gas —for oil —for steam —for water

Westcott & Greis. Inc.
MEASUREMENT AND CONTROL

SALES and SERVICE

WESTCOTT & GREIS INC. W&G MEASUREMENT & CONTROL

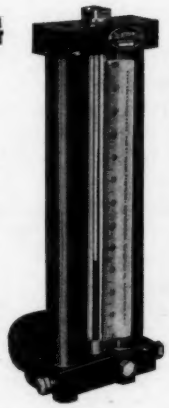
MERIAM INDICATING FLOW METERS

MERIAM Test or Indicating Flow Meters are used where accurate knowledge of the Rate of Flow is necessary and for a permanent check on Orifice Meters. They are made in three types for various kinds of work. The scales are made of aluminum with etched black figures that are easily read.

TYPE "B." This test meter stands 11" in height and weighs 12 pounds. It is machined from bar steel and steel tubes and is tested to 150 pounds working pressure. Should be used for GAS and AIR only, as the glands on this instrument are not packed to withstand hot oils.

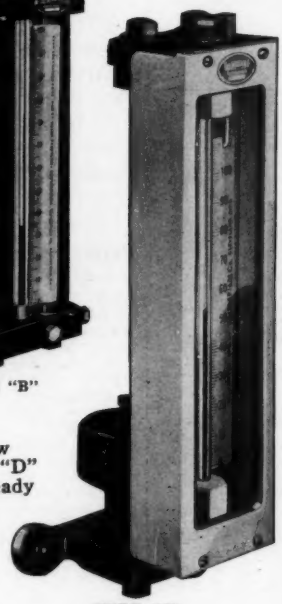
TYPE "C." This instrument, which is gland packed, can be used with working pressures up to 1000 pounds, and can be used with GAS or AIR and with ANY LIQUID at ANY temperature.

Fitted with a safety overflow mercury chamber to prevent the accidental blowing over of the mercury into the line. The stuffing box at each end of the glass tube is packed with John Manville "Jewett" rings, especially molded for this instrument.



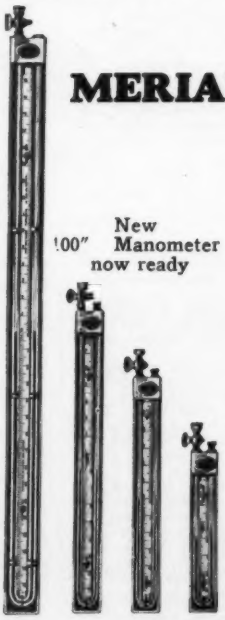
TYPE "B"

New Type "D" now ready



TYPE "C"

MERIAM "U" TYPE MANOMETERS



New 100" Manometer now ready

Influenced solely by gravitation, the pressure readings above or below atmosphere, as indicated by MERIAM "U" TYPE MANOMETERS, are absolutely accurate. The frames are light in weight, being of cast aluminum, in one piece. The weight of the 50" size is only five pounds.

FOR TESTING: The 30" and 50" sizes are used extensively in testing and checking the accuracy of Orifice Meters and Low Pressure Recording Gauges. They are reinforced by skids or runners extending their entire length, thus making them durable and accurate instruments for laboratory or field use. The 100" size is of a collapsible type, with total range of 100 inches graduated in inches and tenths. Length of instrument for portable purposes is 57 inches.

Any MERIAM "U" TYPE MANOMETER can be used to accurately ascertain the Specific Gravity of any fluid.

All Manometers shipped from stock are supplied with scales graduated as given in the following price lists. Inches and tenths graduations will be furnished unless otherwise ordered.

Westcott & Greis, Inc.
MEASUREMENT AND CONTROL

CONTROL, Electrical

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
ELECTRIC CONTROLLER & MFG. CO., 2700 E. Seventy-Ninth St., Cleveland, Ohio. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Houston Armature Works, Houston, Texas
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Maintenance Co., Inc., 449-53 W. Forty-Second St., N. Y., N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

CONTROLLERS, Boiler

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

CONTROLLERS, Compressor

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

CONTROLLERS, Feed Water

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

CONTROLLERS, Humidity

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.

CONTROLLERS, Liquid Level

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa.. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Buddenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

CONTROLLERS, Motor

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

CONTROLLERS, Pressure

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

CONTROLLERS, Pump

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

CONTROLLERS, Tank

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

CONTROLLERS, Temperature

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Charles Englehard, Inc., 30 Church St., New York, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Honeywell Heating Specialties Co. Wabash. Ind.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.

C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Wilson Maeulen Co., 383 Concord Ave., New York, N. Y.

CONTROLLERS, Wax Sweating

C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.

CONVEYORS

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.

CONVEYORS, Ash

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.

Allen & Billmyre Co., Inc., Grand Central Palace, New York City, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
Frederick Iron & Steel Co., Frederick, Md.
F. W. Gartner, Houston, Texas.
Horton Machine Works, 4th at Magee Sts., Elmira, N. Y.
Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
The Lakewood Engineering Co., Cleveland, Ohio
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Supply Co., Toledo, Ohio
Union Engineering Co., Cleveland, Ohio.
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.
Western Gas Construction Co., Fort Wayne, Ind.

CONVEYORS, Gravity

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.

CONVEYORS, Pneumatic

Allen & Billmyre Co., Inc., Grand Central Palace, New York City N. Y.
Bayley Mfg. Co., 73 Greenbush St., Milwaukee, Wis.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
M. C. Carlisle & Co., Inc., 575 Albany St., Boston (18), Mass.
B. F. Sturtevant Co., Hyde Park. Boston, Mass.

CONVEYORS COKE Pneumatic

The Brady Conveyors Corp., 20 W Jackson Blvd., Chicago, Ill.

CONVEYORS, Rotary

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
WEIMAR ENGINEERING WORKS, Westmoreland & Jasper Sts., Philadelphia, Pa. See Advertisers' Index.

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Union Engineering Co., Cleveland. Ohio.
Warren Webster & Co., Camden. N. J.

COOLERS, Brine

Frick Co., Inc., Waynesboro, Pa.

COOLERS, Gas

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
GRISCOM - RUSSELL CO. 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO 12th & Thompson Sts., Philadelphia. Pa. See Advertisers' Index
SOUTHWESTERN ENGINEERING CO.. Hollingsworth Bldg. Los Angeles, Cal. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963. Tulsa Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
Arctic Ice Machine Co., Canton, Ohio
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Dover Boiler Works, 50 Church St. New York, N. Y.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
New York Engineering Co., 2 Rector St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Western Gas Construction Co., Fort Wayne, Ind.

COOLERS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

COOLERS, Water

Jewell Polar Co.; 9 S. Clinton St., Chicago, Ill.

COOLERS, Jacket Water

GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.

COOLING PONDS

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
E. B. BADGER & SONS CO., 63-75 Pitts St., Boston, Mass. See Advertisers' Index.
THE COOLING TOWER CO., INC., 15 John Street, New York, N. Y. See Advertisers' Index.
POWER PLANT EQUIPMENT CO., 1004 Coca Cola Bldg., Kansas City, Mo. See Advertisers' Index.
SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.

Edwin Burhorn Co., 25 West Broadway, New York, N. Y.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
Monarch Mfg. Works, Emery & E. Westmoreland Sts., Philadelphia, Pa.
National Supply Co., Toledo, Ohio
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Tennant Co., Union National Bank Bldg., Houston, Texas.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

COOLING SYSTEMS, Spray Nozzle

THE COOLING TOWER CO., INC., 15 John Street, New York, N. Y. See Advertisers' Index.

COPPER AND BRASS WORK, to Special Specifications

Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.

COPPER GOODS

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
U. S. Indestructible Gasket Co., 829 E. Fifteenth St., Brooklyn,

CORKS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

Armstrong Cork & Insulation Co., Pittsburgh, Pa.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Griebel Instrument Co., Carbondale, Pa.
Illinois Glass Co., Alton, Ill.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.

CORKS, Rubber

Diamond Rubber Co., Inc., Akron, Ohio.

COUNTERSHAFTS

WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

COUNTERS. Steel

Lyon Metallic Mfg. Co., Aurora, Ill.

COUPLERS, Car

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.

COUPLINGS, Flexible

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
R. D. Nuttall Company McCandless & Harrison Avenues, Pittsburgh, Pa.
The P. H. & F. M. Roots Co., Connersville, Ind.
T. B. Wood's Sons Co., Chambersburg, Pa.

COUPLINGS, Friction Clutch

Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.

COUPLINGS, Hose

Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Wm. H. Keller, Inc., Grand Haven, Mich.

COUPLINGS, Jaw

Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.

COUPLINGS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

COUPLINGS, Shaft

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELECTRIC CONTROLLER & MFG. CO., 2700 E. Seventy-Ninth St. Cleveland, Ohio. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
The Falk Corporation, Milwaukee, Wisconsin.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
Frederick Iron & Steel Co., Frederick, Md.
Hall & Brown Wood Working Machine Co., Broadway, Tyler & Ninth Sts., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Meriam Co., 8405 Detroit Ave., Cleveland, Ohio
Mesta Machine Co., Pittsburgh, Pa.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo. Ohio
W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Rogers Foundry & Machine, Joplin, Mo.
The P. H. & F. M. Roots Co., Connersville, Ind.
Southern Engine & Pump Co., Houston, Texas
Terry Steam Turbine Co., Hartford, Conn.
Texas Belting Co., Houston, Texas.
Union Iron Works, Selma, Ala.
Weller Mfg. Co., 1820 N. Kostner Ave., Chicago, Ill.
T. B. Wood's Sons Co., Chambersburg, Pa.

COVERS, Dome

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.
BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
GREENE BROTHERS, 524 - 8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Bruce-Macbeth Engine Co., Cleveland, Ohio
Continental Supply Co., St. Louis, Missouri
Rogers Foundry & Machine, Joplin, Mo.

COVERS, Gauge, Thief Hole

BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
The Petroleum Iron Works Co., Sharon, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.

COVERS, Handhole

Glasgow Iron Co., Pottstown, Pa.

COVERS, Manhole

OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

Glasgow Iron Co., Pottstown, Pa.

COVERINGS, High Pressure

Armstrong Cork & Insulation Co., Pittsburgh, Pa.
R. V. Aycock Co., Kansas City, Mo.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Philip Carey Co., Cincinnati, Ohio
Rogers Asbestos Co., Houston, Texas.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.

COVERING, Magnesia Boiler

Ehrot Magnesia Mfg. Co., Valley Forge, Pa.

COVERINGS, Pipe

BANNER ROCK PRODUCTS CO. Alexandria, Ind. See Advertisers' Index.
WALWORTH CO., 88 PEARL St., Boston, Mass. See Advertisers' Index.

Acme Asbestos Cov. & Supply Co., 242 N. Elizabeth St., Chicago, Ill.
American District Steam Co. North Tonawanda, N. Y.
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
R. V. Aycock Co., Kansas City, Mo.
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Norristown Mangesia & Asbestos Co., Norristown, Pa.
Paraffine Cos. Inc., San Francisco, Calif.
Philip Carey Co., Cincinnati, Ohio
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rogers Asbestos Co., Houston, Texas.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.
Union Fibre Co., Winona, Minn.

COVERINGS, Roof Manhole

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Continental Supply Co., St. Louis, Missouri
Greenlee Foundry Co., 662 W. Roosevelt Rd., Chicago, Ill.

CRACKING PROCESSES

THE TEXAS CO., 17 Battery Place. New York, N. Y.
UNIVERSAL OIL PRODUCTION CO., 312 S. Michigan Ave., Chicago, Ill. See Advertisers' Index.

CRANES

Brazelton, Wessendorff & Nelms, Houston, Texas.
A. D. Granger Co., 15 Park Row, New York, N. Y.

CRUSHERS

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

CUPS AND RINGS, Leather, Hydraulic

Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

CUTTERS, Flue

ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
LAGONDA MFG. COMPANY Springfield, Ohio. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
R. S. Newbold & Son Co., Norristown, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.

CUTTERS, Milling

Reed-Prentice Co., Worcester, Mass.

CUTTERS, Pipe

WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Armstrong Bros. Tool Co., 302 N. Francisco Ave., Chicago, Ill.
Armstrong Mfg. Co., 348 Knowlton, Bridgeport, Conn.
Borden Co., Wagner, Ohio.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Curtis & Curtis Co., 330 Garden St., Bridgeport, Conn.
Greenfield Tap & Die Corp'n., Greenfield, Mass.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Landis Machine Co., Inc., Waynesboro, Pa.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo, O.
Trimont Mfg. Co., 55 Armory St., Roxbury, Boston, Mass.
Union Iron Works, Selma, Ala.

CUTTERS, Pneumatic Rivet

King Pneumatic Tool Co., 1733 Armitage Ave., Chicago, Ill.

CUTTERS, Tube

ELIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
LAGONDA MFG. COMPANY Springfield, Ohio. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
R. S. Newbold & Son Co., Norristown, Pa.
Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

CUTTING APPARATUS

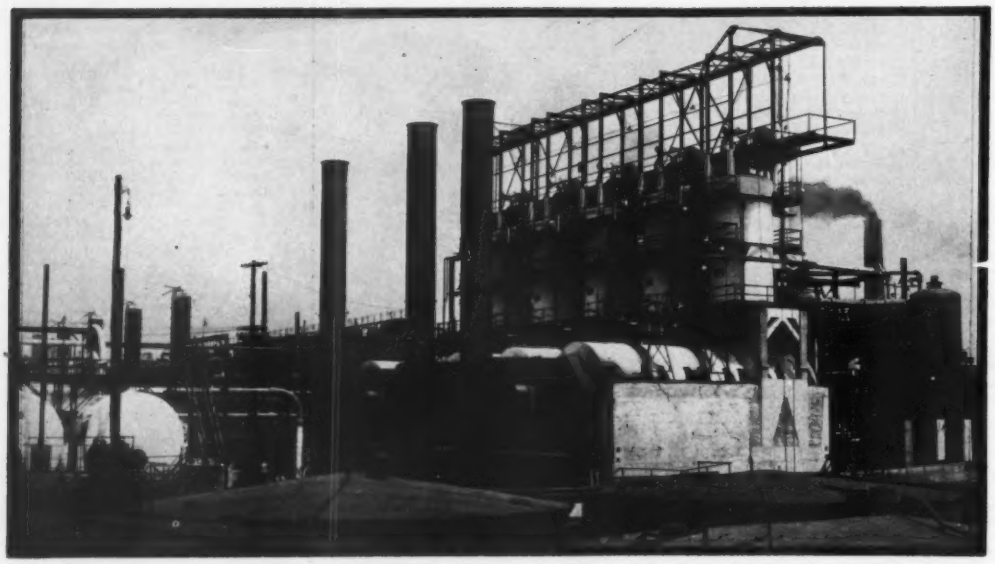
Oxweld Acetylene Co., Long Island City, L. I., N. Y.

D

DAMPERS

NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
PRIBLICO JOINTLESS BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

LEAST FIRST COST FOR --



FRACTIONATING TOWERS
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PIPE STILLS
TOPPING PLANTS
etc.

FRACTIONATION

E·B·BADGER & SONS COM
NEW YORK — ANN ARBOR

MAXIMUM YIELDS — MINIMUM OPERATING EXPENSES

THE Badger Systems and Equipment for fractionating petroleum are furnished by the oldest and largest builder of efficient distilling apparatus in the United States.

A guaranteed Badger plant costs less, for the same results, than substantially any other system. Many of the largest refiners know this.

Badger Systems are the result of extended practical experience in many refineries, thorough and careful research; and the most efficient engineering.

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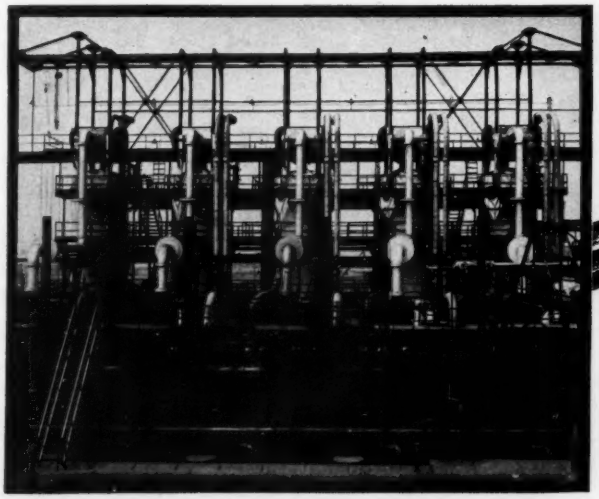
BARNSDALL CORP.
HUMBLE OIL & REFINING CO.
TIDAL REFINING CO.
STANDARD OIL CO., OF N. J.



EQUIPMENT

PANY · BOSTON · MASS ·

KANSAS CITY — TULSA

Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Erie City Iron Works, Erie, Pa.
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
International Heater Co., 101 Park Ave. Utica, N. Y.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
B. F. Sturtevant Co., Hyde Park, Boston, Mass.

DECKS, Floating Tank

Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.

DEHYDRATING EQUIPMENT

NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
THE WINKLER-KOCH ENGINEERING CO., 429 First Natl. Bank Bldg., Wichita, Kansas. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
The Burroughs Co., 246 N. Tenth St., Newark, N. J.
Carbondale Machine Co., Carbondale, Pa.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
The Sharples Specialty Co., 23rd and Westmoreland Sts., Philadelphia, Pa.

DEPHLEGMATORS

BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
C. F .BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Blaw-Knox Co., Pittsburgh, Pa.
Carbondale Machine Co., Carbondale, Pa.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Dover Boiler Works, 50 Church St., New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
Western Gas Construction Co., Fort Wayne, Ind.
Whitlock Coil Pipe Co., Hartford, Conn.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

DETECTORS, Flow

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia Pa.
Lewis Steam Specialty & Valve Co., 5145 Delancey St., Philadelphia, Pa.

DETECTORS, Gas

MINE SAFETY APPLIANCE Co., 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.

DEVICES, Filteration and Water Softening

Paige & Jones Chemical Co., 461-3 Fourth Ave., New York, N. Y.

DIE HEADS

WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Curtis & Curtis Co., 330 Garden St., Bridgeport, Conn.
Greenfield Tap & Die Corp'n., Greenfield, Mass.
Greenlee Foundry Co., 662 W. Roosevelt Rd., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
Landis Machine Company, Waynesboro, Pa.
Murchey Machine & Tool Co., 950 Porter St., Detroit, Michigan.
Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

DIES

Paragon Machine Co., 77 South Ave., Rochester, N. Y.

DIES, Pipe

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

DIE STOCKS, Plain

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

DIE STOCKS, Ratchet

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

DIFFUSING FURNACES

PLIBRICO JOINTLESS FIREBRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.

DISINFECTANTS

The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

DISTILLATION APPARATUS

BONER & SHELDON, MFG. ENGINEERS, 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
WINKLER and KOCH, 429 First National Bank, Wichita, Kansas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bousman Mfg. Co., Inc., 1153-57 Plainfield Ave., N. E., Grand Rapids, Mich.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Griebel Instrument Co., Carbondale, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia Pa.
Precision Scientific Co., 822 S. Triff Ave., Chicago, Ill.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Treadwell Construction Co., Midland, Pa.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

DOORS, Ash Pit

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.

DOOR BUCKS

E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.

DOORS, Furnace

BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
DeSoto Foundry & Machine Co., Mansfield, La.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Fuller-Lehigh Co., Fullerton, Pa.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., North Side, Pittsburgh, Pa.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

DOORS AND PARTITIONS, Kalamein

Kalamein
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.

DOORS, Steel

Tuscon Steel Co., Youngstown, O.

DOORS, Tinclad and Kalamein

Penn Metal Co., 675 Concord Ave., Cambridge, Mass.

DRAFTING, Apparatus

WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Gilson Slide Rule Co., Niles, Mich.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
New York Blue Print Paper Co., 102 Reade St., New York, N. Y.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

DRAWING, Equipment

WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

DRESSERS, Wheel

Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.

DRESSERS, Emery Wheel

Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio

DRILLS, Electric

Brazelton, Wessendorff & Nelms, Houston, Texas.
Jas. Clark, Jr., Electric Co., 600 E. Bergman St., Louisville, Ky.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Goodell-Pratt Co., 57 Wells St., Greenfield, Mass.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Milwaukee Elec. Tool Corp., Milwaukee, Wis.

DRILLS, Hammer, Rock, Compressed Air

Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.

DRILLS, Pneumatic

Brazelton, Wessendorff & Nelms, Houston, Texas.
Wm. H. Keller, Inc., Grand Haven, Mich.
May Machinery Co., Second National Bank Bldg., Houston, Tex.

DRILLS, Radial

Brazelton, Wessendorff & Nelms, Houston, Texas.
Reed-Prentice Co., Worcester, Mass.

DRILLS, Twist

Brazelton, Wessendorff & Nelms, Houston, Texas.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Greenfield Tap & Die Corp'n., Greenfield, Mass.

SKELLY

Natural Gasoline as Skelly makes it

First it takes careful management . . . then modern plant equipment . . . location . . . plenty of tank cars . . . finally keen desire on the part of employees to make their product excel—all these to produce Natural Gasoline as Skelly makes it.

The Natural Gasoline division of Skelly Oil Company, with its 15 efficient plants, is organized to give quality, uniformity and service.

Every grade must be true to specifications. Every shipment must leave when promised.

If you have not used Natural Gasoline as Skelly makes it, get in touch with us the next time you are in the market.

SKELLY OIL COMPANY

Tulsa El Dorado, Kans.

Kansas City, Mo. Omaha Minneapolis

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There is one advantage in the fact that gasoline prices are, as most authorities agree, at bottom Prices can now move in only one direction—*up*

And when they do, the refiner who is able to feed his stock of low-grade crude, direct or topped, to his Dubbs Cracking Units and obtain the maximum yield of good Knoxless-Pullsmore gasoline will have the advantage over the refiner who must restrict his charging stocks to the higher priced gas oil and distillates with lower yields and higher costs

The refiner with Dubbs cracking equipment will be in no danger of seeing "red" when he sees his monthly balance sheet If your balance sheet is showing red—pink—or even pale black—there is one quick and sure remedy

Universal Oil Products Company
Owner of the Dubbs Process
310 South Michigan Ave
Chicago, Illinois

DRIVERS, Hoop

Weimar Engineering Works, Westmoreland & Jasper Sts., Philadelphia, Pa.

DRUMS, Shipping

Geuder, Paeschke & Frey Co., Western Valley, Milwaukee, Wis.

DRYERS

NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

The American Blower Co., 6004 Russell, Detroit, Mich.
American Iron Works, Inc., Louisville, Ky.
Arco Co., Cleveland, Ohio
Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Fuller-Lehigh Co., Fullerton, Pa.
Hardinge Co., Inc., York, Pa.
International Engineering Works, Inc., Framingham, Mass.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
National Electric Heating Co., 10 High St., Boston, Mass.
New York Engineering Co., 2 Rector St., New York, N. Y.
Pangborn Corp., Hagerstown, Md.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.
B. F. Sturtevant Co., Hyde Park, Boston, Mass.
Treadwell Construction Co., Midland, Pa.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

DUCTS, Air

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

DYES

The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

E

ECONOMIZERS

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J.
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Heine Boiler Co., St. Louis, Mo.
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Plouff Co., 170 Summer St., Boston, Mass.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sims Co., Erie, Pa.
B. F. Sturtevant Co., Hyde Park, Boston, Mass.

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THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
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WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
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Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
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Penberthy Injector Co., 340 Holden Ave., Detroit, Mich.
Plouff Co., 170 Summer St., Boston, Mass.
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Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Union Iron Works, Selma, Ala.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
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ELEVATORS, Bucket

Hendrick Mfg. Co., Carbondale, Pa.
Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

ELEVATORS, Tray

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

ELIMINATORS, Condensation

Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.

ELIMINATORS, Oil

GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.

The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
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Plouff Co., 170 Summer St., Boston, Mass.
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ENAMEL, Oil Proof Tank

Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.

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ENAMEL, Seepage Proof for Concrete.

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Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

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COOPER, C. & G., CO., Mt. Vernon, Ohio. See Advertisers' Index.
HOPE ENGINEERING & SUPPLY CO., Mount Vernon, Ohio. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

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The Buda Co., Harvey, Ill.
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Charter Gas Engine Co., Sterling, Illinois.
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Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
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F. W. Gartner Co., Houston, Texas.
Heer Gas & Oil Engine Co., Portsmouth, Ohio.
The Hercules Corp., Evansville, Ind.
Horton Machine Works, Fourth & Magee Sts., Elmira, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Lucey Mfg. Corp'n., Woolworth Bldg., New York, N. Y.
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Mesta Machine Co., Pittsburgh, Pa.
Miller Improved Gas Engine Co., Springfield, Ohio.
National Transit Pump & Machine Co., Oil City, Pa.
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Otto Engine Works, 32nd & Walnut St., Philadelphia, Pa.
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Rathbun-Jones Engineering Co., Spencer St., Toledo, Ohio.
Joseph Reid Gas Engine Co., Oil Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Southern Engine & Pump Co., Houston, Texas
Sterling Engine Co., 1252-1274 Niagara St., Buffalo, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Superior Gas Engine Co., Springfield, Ohio
Tennant Co., Union National Bank Bldg., Houston, Texas.
Tips Foundry & Machine Co., Austin, Texas
Titusville Iron Works, Titusville, Pa.
Western Machinery Co., Los Angeles, Calif.
Witte Engine Works, 16th & Oakland Ave., Kansas City, Mo.
Wolvervine Motor Works, Inc., 35 Union Ave., Bridgeport, Conn.

ENGINES, Gasoline

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
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National Supply Co., Toledo, Ohio
Novo Engine Co., Lansing, Mich.
Oil Well Supply Co., Pittsburgh, Pa.
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Sterling Engine Co., 1252-1274 Niagara St., Buffalo, N. Y.
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Union Gas Engine Co., Oakland, Calif.
Universal Motor Co., 39 Ceape St., Oshkosh, Wis.
Western Machinery Co., Los Angeles, Calif.
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ENGINES, Hoist

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Continental Supply Co., St. Louis, Missouri
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Western Machinery Co., Los Angeles, Calif.

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THE C. & G. COOPER CO., Mount Vernon, Ohio. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

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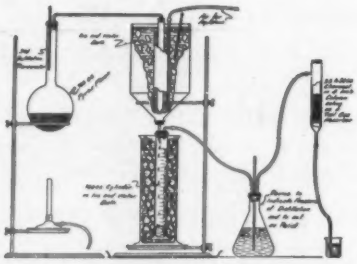

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Rathbun-Jones Engineering Co., Spencer St., Toledo, Ohio.
Joseph Reid Gas Engine Co., Oil City, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Superior Gas Engine Co., Springfield, Ohio
Taylor Oil Engines, Inc., 310 S. Wabash Ave., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Tips Foundry & Machine Co., Austin, Texas
Union Gas Engine Co., Oakland, Calif.
Western Machinery Co., Los Angeles, Calif.
Witte Engine Works, 16th & Oakland Ave., Kansas City, Mo.
Wolverine Motor Works, Inc., 35 Union Ave., Bridgeport, Conn.

ENGINES, Steam

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Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
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National Supply Co., Toledo, Ohio
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Oil Well Supply Co., Pittsburgh, Pa.
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Ridgway, Dynamo & Engine Co., Ridgway, Pa.
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B. F. Sturtevant Co., Hyde Park, Boston, Mass.
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Titusville Iron Works, Titusville, Pa.
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EQUIPMENT, Gas and Oil Burning

The Maxon Premix Burner Co., Muncie, Ind.

EQUIPMENT, Hospital

Frank S. Betz Co., Hammond, Ind.

EQUIPMENT, Mechanical, Painting

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W. N. Matthews Corp., 3714 Forrest Park Blvd., St. Louis, Mo.

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Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

EQUIPMENT, Safety

PULMOSAN SAFETY EQUIPMENT CO., 45 Willoughby St., Brooklyn, N. Y. See Advertisers' Index.

EQUIPMENT, Tank

WESTCOTT & GRIES, INC., Tulsa, Okla. See Advertisers' Index.

EQUIPMENT, Tool Room

Brazelton, Wessendorff & Nelms, Houston, Texas.
Lyon Metallic Mfg. Co., Aurora, Ill.

EQUIPMENT, Wax Plant

Bethlehem Shipbuilding Corp., Bethlehem, Pa.

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HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
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STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Ind.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
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WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Bass Foundry & Machine Co., Fort Wayne, Ind.
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Connersville Blower Co., Connersville, Ind.

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UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo.

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National Supply Co., Toledo, Ohio
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A. L. HENDERER'S SONS, Maryland Ave. & Beech St., Wilmington, Delaware. See Advertisers' Index.

F

FANS

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FANS, Cooling Tower

Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.

FANS, Exhaust

Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.

FANS, Ventilator

Emerson Electric Mfg. Co., St. Louis, Mo.
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FAUCETS, Barrel

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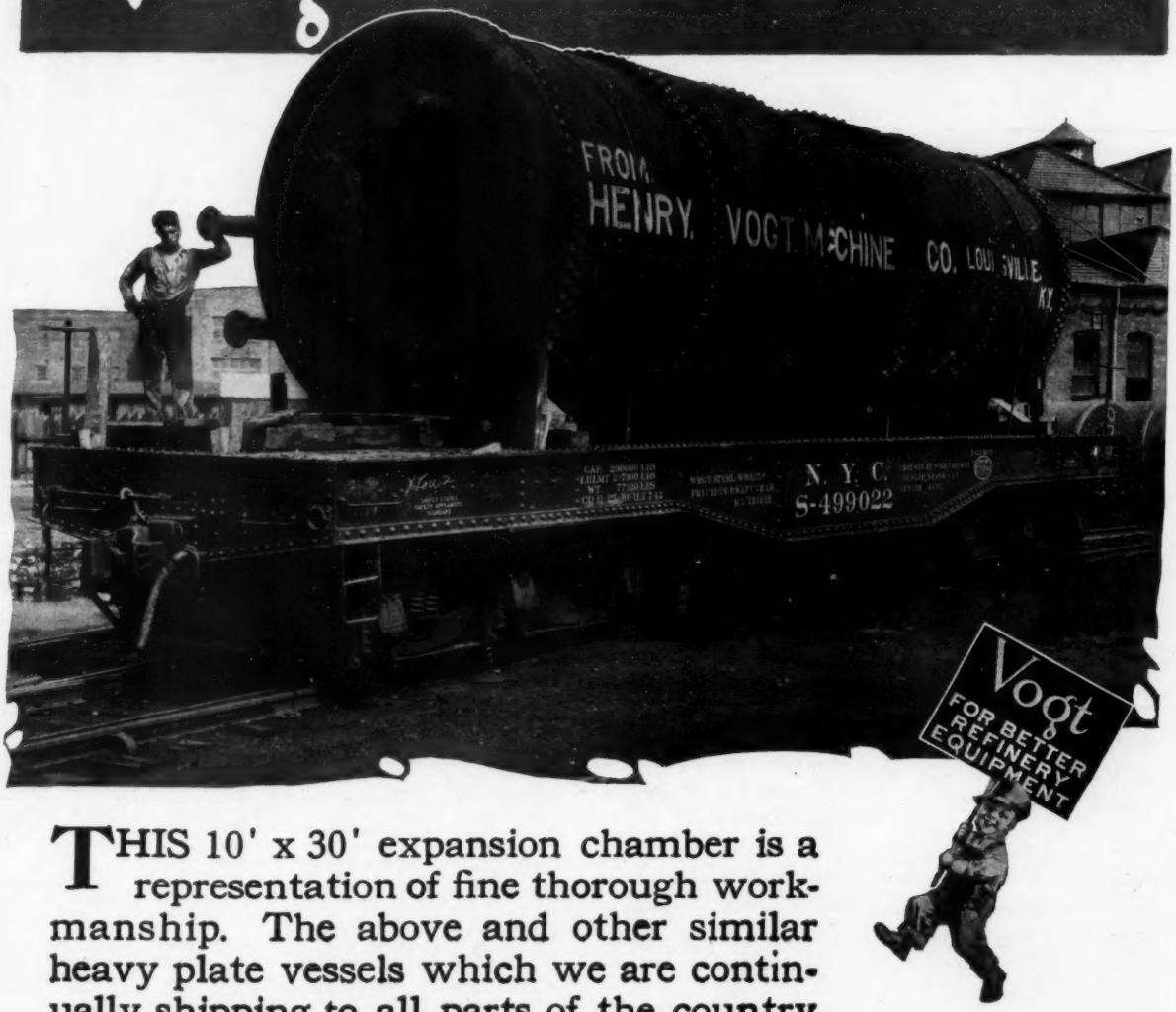

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Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Cleveland Brass Mfg. Co., 4605 Hamilton Ave., Cleveland, Ohio.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Morrison Bros., Dubuque, Iowa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
The Petroleum Iron Works Co., Sharon, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
United Brass Mfg. Co., Cleveland, Ohio.

FAUCETS, Hard Lead

United Lead Co., 111 Broadway, New York, N. Y.

FEEDERS, Boiler

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Fuller-Lehigh Co., Fullerton, Pa.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Kelley & Mueller, Inc., 34 W Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lake Erie Mfg. Co., Inc., 192-198 Chicago St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Plouff Co., 170 Summer St., Boston, Mass.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Union Iron Works, Selma, Ala.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.

FEEDERS, Boiler Compound

FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WARD CHEMICAL COMPANY 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Arrow Boiler Compound Co., 3929 Olive St., St. Louis, Mo.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Products Co., Euclid, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Perolin Co. of America, 2010 Peoples Gas Bldg., Chicago, Ill.
Plouff Co., 170 Summer St., Boston, Mass.
Reiter Co., 259 N. St., Elgin, Ill.
Sims Co., Erie, Pa.

FELT, Asbestos Pipe Line

Philip Carey Co., Cincinnati, Ohio

FELT, Hair

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Norristown Mangesia & Asbestos Co., Norristown, Pa.
Rogers Asbestos Co., Houston, Texas.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

FENCE

American Rolling Mill Co., Middletown, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Fence & Wire Co., Dallas, Texas
R. B. Everett Co., Houston, Texas
Page Steel & Wire Co., 208 S. La Salle, Chicago, Ill.
Pittsburgh Steel Co., Union Arcade Bldg., Pittsburgh, Pa.
Texas Cyclone Fence Co., 1316 E. Front St., Ft. Worth, Texas.

FERRULES, Copper

Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio

FIBRE, Asbestos

Philip Carey Co., Cincinnati, Ohio

FILLER, Paste Iron

DETROIT GRAPHITE CO. OF TEXAS, 1506 2nd Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

FILTERS, Air

THE COOLING TOWER CO., INC., 15 John Street, New York N. Y. See Advertisers' Index.

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex

FILTERS, Gas

METRIC METAL WORKS OF AMERICAN METER CO., Erie, Pa. See Advertisers' Index.

FILTERS, Oil

BIGGS BOILER WORKS CO., Case Ave. and Newton St., Akron, Ohio. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

James Bonar & Co., Park Bldg., Pittsburgh, Pa.
Bousman Mfg. Co., Inc., 1153-57 Plainfield Ave., N. E., Grand Rapids, Mich.
Bowser, S. F., & Co., Inc., 1230 Bowser Ave., Fort Wayne, Ind.
Burt Mfg. Co., Akron, Ohio.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Norton Co., Worcester, Mass.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil & Waste Saving Machine Co., 1509 Real Estate Trust Bldg., Philadelphia, Pa.
Oliver Continuous Filter Co., Oakland, Calif.
Plouff Co., 170 Summer St., Boston, Mass.
Sexton Can Company, Inc., 123 Broad St., Boston, Mass.
T. Shriver & Co., 844 Hamilton St., Harrison, N. J.
Sims Co., Erie, Pa.
Standard Tank Car Co., Sharon, Pa.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Titusville Iron Works, Titusville, Pa.
Turner Oil Filter Co., Niles, Mich.

FILTERS, Percolating

HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.

FILTERS, Water

BIGGS BOILER WORKS CO., Case Ave. and Newton St., Akron, Ohio. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
PAIGE & JONES CHEMICAL CO., Hammond, Ind. See Advertisers' Index.
POWER PLANT SPECIALTY CO., 440 So. Dearborn St., Chicago, Ill. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

American Water Softener Co., Lehigh Ave. at Fourth St., Philadelphia, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
Frick Co., Inc., Waynesboro, Pa.
International Filter Co., 335 W. Twenty-Fifth Place, Chicago, Ill.
Kansas City Structural Steel Co., Kansas City, Kansas.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Plouff Co., 170 Summer St., Boston, Mass.
Reisert Automatic Water Purifying Co., 23 E. 26th St. New York, N. Y.
Roberts Filter Mfg., Co., 6th and Columbia Ave., Darby, Pa.
Wm. Scaife & Sons Co., Oakmont, Pa.
T. Shriver & Co., 844 Hamilton St., Harrison, N. J.
Sims Co., Erie, Pa.
Thomas Pump Works, 154 Spring St., New York, N. Y.
York Products Corporation, Houston, Texas.

FINDERS, Fault

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

FIRE APPARATUS, Motorized

Amdyco Corporation, 100 E. 42nd St., New York, N. Y.
Foamite-Childs Corp., Utica, N. Y.

FIRE EXTINGUISHERS

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

Amdyco Corporation, 100 E. 42nd St., New York, N. Y.
American Fire Equipment Co., Boston, Mass.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Charles Bond Co., 617-619 Arch St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Foamite-Childs Corp., Utica, N. Y.
Globe Automatic Sprinkler Co., 2035 Washington Ave., Philadelphia, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Lewis Steam Specialty & Valve Co., 5145 Delancey St., Philadelphia, Pa.
National Supply Co., Toledo, Ohio
Petroleum Supply Co., Houston, Texas
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.
Texas Belting Co., Houston, Texas.

FIREPROOFING MATERIALS

BANNER ROCK PRODUCTS CO., Alexandria, Ind. See Advertisers' Index.
CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
JOHNS-MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.

R. V. Aycock Co., Kansas City, Mo.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Harbison Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh, Pa.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Philip Carey Co., Cincinnati, Ohio
Rogers Asbestos Co., Houston, Texas.

FIRST AID SUPPLIES

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
MINE SAFETY APPLIANCE CO., 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.
PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

Frank S. Betz Co., Hammond, Ind.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.

FITTINGS, Ammonia

THE VILTER MANUFACTURING CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

York Products Corporation, Houston, Texas.

FITTINGS ANGLE Adjustable

American District Steam Co., N. Tonawanda, N. Y.

FITTINGS, Boiler

D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

FITTINGS, Cast Iron

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.

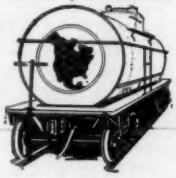
Forerunners of the Tank Car

In the infant days of the oil industry, the transportation of crude was a serious problem. Miles away from railroad service, the operator was forced to barrel his production, and then entrust it to unscrupulous teamsters with primitive equipment, who charged outrageous prices to haul it to the nearest shipping point.

As the volume of shipping increased, the tank car was developed; and as tank cars became increasingly important, progressive shippers sought to have control of the cars that their companies needed.

Out of this condition grew the business of tank car leasing—offering the highest type of tank car facilities at minimum cost; taking care of seasonal requirements; reducing maintenance and operating costs through the economies of mass operation—and, most important, allowing the shipper to exercise the advantages of ownership and yet have the use of the heavy capital outlay that ownership entails.

For nearly two decades North American Car Corporation has provided shippers of liquids with modern tank equipment suited to their particular industries. This service is maintained through the operation of four strategically located shops and protected by the specialized knowledge so many years of experience has given us.



NORTH AMERICAN CAR CORPORATION, 327 S. La Salle St., Chicago, Ill.

North American

CAR LEASING SERVICE

POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Baston, Mass.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American Cast Iron Pipe Co, Birmingham, Alabama
American District Steam Co. North Tonawanda, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Grinnell Co., Inc., Providence, R.I
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Hartwell Iron Works, Houston Texas
Horton Machine Works, 4th & Magee Sts., Elmira, N. Y.
Houston Car Wheel & Machine Co., Houston, Texas.
Illinois Mallable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Independent Foundry Co., 73 York St., Portland, Ore.
International Heater Co., 101 Park Ave. Utica, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Milwaukee Steam Appliance Co., West Allis, Wis.
Myerstown Foundry & Mfg. Co., 90 West St., New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Cast Iron Pipe Co., Birmingham, Ala.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston. Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Shaw-Kendall Engineering Company, 120-130 S. Superior St. Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Union Iron Works, Selma, Ala.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Cast Steel

HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
OHIO STEEL FOUNDRY CO., Springfield. Ohio. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Continental Supply Co., St. Louis, Missouri
DeSoto Foundry & Machinery Co., Mansfield, La.
Frick Co., Inc., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Myerstown Foundry & Mfg. Co., 90 West St., New York, N. Y.
Nason Manufacturing Company, 7 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston. Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Drop Forged

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Arctic Ice Machine Co., Canton, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carbondale Machine Co., Carbondale, Pa.
Continental Supply Co., St. Louis, Missouri
Great Lakes Forge Co., 14 E. Jackson Blvd., Chicago, Ill.
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill
Nason Manufacturing Company, 7 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Flanged

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston. Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
OHIO STEEL FOUNDRY CO., Springfield. Ohio. See Advertisers' Index.

POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
THE VILTER MFG. CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American District Steam Co., North Tonawanda, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Carbondale Machine Co., Carbondale, Pa.
Continental Supply Co., St. Louis, Missouri
Driver-Harris Co., Harrison, N. J.
Frick Co., Inc., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co. Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Car Wheel & Machine Co., Houston, Texas.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Mallable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Independent Foundry Co., 73 York St., Portland, Ore.
Jarecki Mfg. Co., Erie, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill
Moloch Co., Kaukauna, Wis.
Nason Manufacturing Company, 7 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
The Petroleum Iron Works Co., Sharon, Pa.
Petroleum Supply Co., Houston. Texas
Philadelphia Coppersmithing Co 222 N. Front St., Philadelphia Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Flanged Steel

HUGHES TOOL CO., 300 Hughes St., Houston. Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.

THE OHIO STEEL FOUNDRY CO., Srpingfield, Ohio. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Continental Supply Co., St. Louis, Missouri
De Soto Foundry & Machinery Co., Mansfield, La.
Frick Co., Inc., Waynesboro, Pa.
Glasgow Iron Co., Pittsburgh, Pa.
Grinnell Co. Inc., Providence, R. I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Malleable Iron Fittings Co., Banford, Conn.
Moloch Co., Kaukauna, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
The Petroleum Iron Works Co., Sharon, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Reading Steel Castings Co., Reading, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Gauge Glass

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.

FITTINGS, Hydraulic

HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
Ridge Arcade Bldg., Kansas City,
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Carbondale Machine Co., Carbondale, Pa.
Continental Supply Co., St. Louis, Missouri
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas

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INCREASED THRUPUT AND YIELD
REDUCED MAINTENANCE COST
AND A SUBSTANTIAL
SAVING IN FUEL !

NO OBLIGATION

B. P. LIENTZ & CO.

Kansas City, Mo.

LOS ANGELES FT. WORTH NEW YORK

Hart Co., Inc., Williamsport, Pa.
Hydraulic Press Mfg. Co., Mt Gilead, Ohio.
Jarecki Mfg. Co., Erie, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 13th and Race Sts., Philadelphia, Pa.
Utility Mfg. Co., Cudahy, Wis.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

FITTINGS, Long Sweep

HUGHES TOOL CO., 300 Hughes St. Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Frick Co., Inc., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Independent Foundry Co., 73 York St., Portland, Ore.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Co., 120 130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fitting Co., Birmingham, Ala.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS MALLEABLE Screwed

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Grinnell Co., Inc., Providence, R.I.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Mallable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Malleable Iron Fittings Co., Branford, Conn.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fitting Co., Birmingham, Ala.
The Youngstown Boiler & Tank Co., Youngstown, Ohio
The Youngstown Sheet & Tube Co., Youngstown, Ohio

FITTINGS, Pipe

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Carbondale Machine Co., Carbondale, Pa.
The Central Forging Co., Catawissa, Penna.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Frick Co., Inc., Waynesboro, Pa.
Glasgow Iron Co., Pottstown, Pa.
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Hydraulic Press Mfg. Co., Mt Gilead, Ohio.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Wm. Powell Co., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St. Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Union Iron Works, Selma, Ala.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Pipe Line

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
The Ohio Steel Foundry Co., Springfield, Ohio
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Continental Supply Co., St. Louis, Missouri
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Stockham Pipe & Fittings Co., Birmingham, Ala.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Steam

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

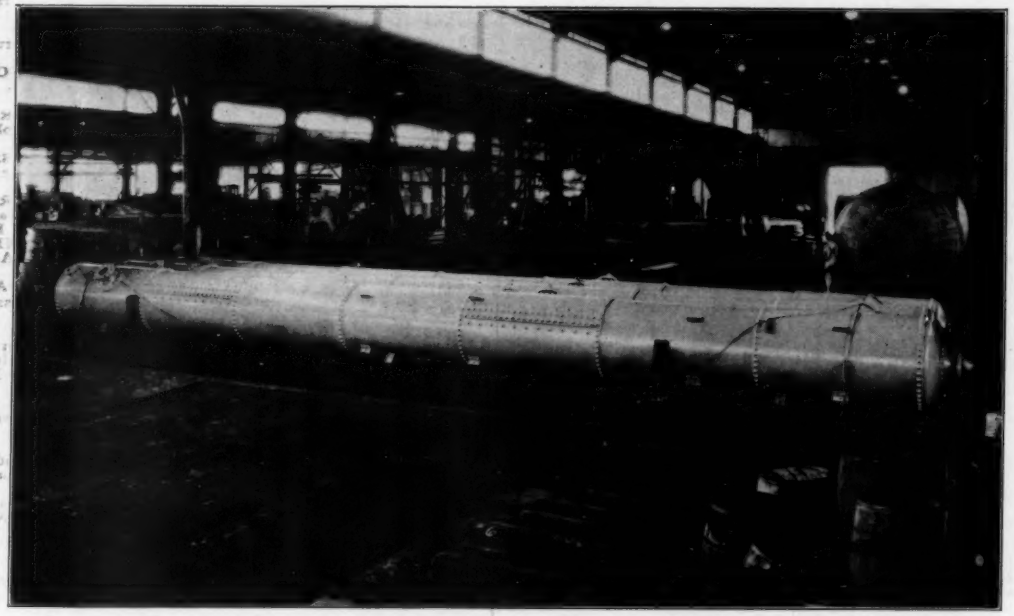
Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J
Continental Supply Co., St. Louis, Missouri
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Wm. Powell Co., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Union Iron Works, Selma, Ala.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Steam Jacketed

The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.

FITTINGS, Steel

HUGHES TOLL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
PENNSYLVANIA FORGE CO., See Advertisers' Index. Bridesburg, Philadelphia, Pa.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City,



Three High Pressure Absorbers Loaded on Sixth Day After Order Was Received

Wyatt Service Meets an Emergency

WITH a battery of high pressure absorbers destroyed by fire and his plant shut down, a certain manufacturer of natural gasoline faced tremendous losses. Contractual obligations weighed heavily.

It was put up to Wyatt. And the photograph above shows just how the challenge was met.

For in six days after the order was received, three new absorbers, 36"x40' designed for 350 lb. working pressure and tested for 550 lbs. hydrostatic pressure were loaded on cars and moved out. Four days later the remaining three absorbers were ready for shipment.

Manufacturers of Refinery and Gasoline Plant Equipment

Wyatt Metal & Boiler Works

DALLAS, TEXAS

HENRY VOGT MACHINE CO., Mo. See Advertisers' Index. Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Arctic Ice Machine Co., Canton, Ohio
Columbia Steel Co., 351 California St., San Francisco, Calif.
Continental Supply Co., St. Louis, Missouri
De Soto Foundry & Machinery Co., Mansfield, La.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Reading Steel Castings Co., Reading, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FITTINGS, Tank

OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

FITTINGS, Union

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Bard Union Co., Inc., Norwich, Conn.
Continental Supply Co., St. Louis, Missouri
E. M. Dart Mfg. Co., 134 Thurbers Ave., Providence, R. I.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Malleable Iron Fittings Co., Banford, Conn.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Wm. Powell Co., Cincinnati, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fittings Co., Birmingham, Ala.
The Youngstown Boiler & Tank Co., Youngstown, Ohio
The Youngstown Sheet & Tube Co., Youngstown, Ohio

FLANGES, Cast Iron

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
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UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
Adkins, Young & Allen Co., 56 Washington Blvd., Chicago, Ill.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Butler Mfg. Co., 1124 Grand Ave. Kansas City, Mo.
Continental Supply Co., St. Louis, Missouri
Erie City Iron Works, Erie, Pa.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Grinnell Co., Inc., Providence, R.I
Gulf Coast Machine & Supply Co. Beaumont, Texas.
Hershey Machine & Foundry Co., Manheim, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Car Wheel & Machine Co., Houston, Texas.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Independent Foundry Co., 73 York St., Portland, Ore.
Jarecki Mfg. Co., Erie, Pa.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Milwaukee Steam Appliance Co., West Allis, Wis.
Moloch Co., Kaukauna, Wis.
Myerstown Foundry & Mfg. Co., 90 West St., New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Nute, McGehee, Geary Co., Chambersburg, Pa.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Oil Well Supply Co., Pittsburgh Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston Texas
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Wm. Powell Co., Cincinnati, Ohio
Shaw-Kendall Engineering Company, 120-130 S. Superior St. Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Tips Foundry & Machine Co., Austin, Texas
Union Iron Works, Selma, Ala.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FLANGES, Cast Steel

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Continental Supply Co., St. Louis, Missouri
DeSoto Foundry & Machinery Co., Mansfield, La.
Erie City Iron Works, Erie, Pa.
Erick Co., Inc., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Malleable Iron Fittings Co., Banford, Conn.
Moloch Co., Kaukauna, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Wm. Powell Co., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Treadwell Construction Co., Midland, Pa.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FLANGES, Companion

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Dished Head

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Floor

BARNHART - DAVIS CO., Warren, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R.I.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Shaw-Kendall Engineering Co., 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Stockham Pipe & Fittings Co., Birmingham, Ala.
Union Iron Works, Selma, Ala.

FLANGES, Forged Steel

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.
Arctic Ice Machine Co., Canton, Ohio
Cann & Saul Steel Co., 516 Commerce St., Philadelphia, Pa.
Carbondale Machine Co., Carbondale, Pa.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Endicott Forging & Mfg. Co., Endicott, N. Y.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
P. H. Gill & Sons Forge & Machine Works, 2 Lorraine St., Brooklyn, N. Y.
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Kansas City Structural Steel Co., Kansas City, Kansas.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pennsylvania Forge Co., Bridesburg, Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.

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John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FLANGES, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

FLANGES, Pipe

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Pressed Steel

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Riveted Work

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Roof

OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index.

FLANGES, Saddle

Glasgow Iron Co., Pottstown, Pa.

FLANGES, Welding

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
POWER PIPING CO., 833 Beave. Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Arctic Ice Machine Co., Canton, Ohio
Cann & Saul Steel Co., 516 Commerce St., Philadelphia, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Grinnell Co., Inc., Providence, R.I.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pennsylvania Forge Co., Bridesburg, Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia. Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
Treadwell Construction Co., Midland, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FLASHLIGHTS

Serve-U Products Co., New Hdye Park, N. Y.

FLOATS, Aluminum

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.

FLOATS, Cork

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.

FLOATS, Nickel

Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.

FLOATS, Seamless Copper

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio

FLOATS, Steel

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio

FLOATS, Wood

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.

FLOOR GRATINGS

KERLOW STEEL FLOORING CO., 226 Culver Ave., Jersey City, N. J. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

American Abrasive Metals Co., 50 Church St., New York, N. Y.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hendrick Mfg. Co., Carbondale, Pa.
Ideal Foundry & Machine Co., Beaver Falls, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nute, McGehee, Geary Co., Chambersburg, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Tips Foundry & Machine Co., Austin, Texas
Union Iron Works, Selma, Ala.
Western Gas Construction Co., Fort

FLUES, Boiler

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Tube & Pipe Bending Co., Niles, Ohio
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
The Brownell Co., Dayton, Ohio
Continental Supply Co., St. Louis, Missouri
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Erie City Iron Works, Erie, Pa.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Heater Co., 101 Park Ave. Utica, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
E. Keeler Co., Williamsport, Pa.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil Well Supply Co., Pittsburgh, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
The Stanwood Corp., Cincinnati, O.
Union Iron Works, Selma, Ala.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FLUSH-OMETERS

Trill Indicator Co., Center St., Corry, Pa.

FLUX, Soldering

M. W. Dunton, Providence, R. I.

FLUX, Welding

Oxweld Acetylene Co., Long Island City, L. I., N. Y.

FORGES

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
Continental Supply Co., St. Louis, Missouri
Eclipse Fuel Engineering Co., Rockford, Ill.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.

FORGES, Rivet

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
MacLeod Company, Cincinnati Ohio
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York, N. Y.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
National Supply Co., Toledo, Ohio
Joseph T. Ryerson & Sons, 2558 W 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.

FORGINGS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

Bass Foundry & Machine Co., Fort Wayne, Ind.
Bethlehem Steel Co., Bethlehem, Pa.
Cann & Saul Steel Co., 516 Commerce St., Philadelphia, Pa.
Cyclops Steel Co., Titusville, Pa.
P. H. Gill & Sons Forge & Machine Works, 2 Lorraine St., Brooklyn, N. Y.
Great Lakes Forge Co., 14 E. Jackson Blvd., Chicago, Ill.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
McInnes Steel Co., Ltd., Corry, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Steel Improvement & Forge Co., Cleveland, Ohio.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Vulcan Steam Forging Co., 247 Rano St., Buffalo, N. Y.
Wm. Wharton, Jr. & Co., Inc., 30 Church St., New York, N. Y.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

FORGINGS, Drop

Endicott Forging & Mfg. Co., Endicott, N. Y.

FORGINGS, Hollow

PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.

Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Mesta Machine Co., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Vulcan Steam Forging Co., 247 Rano St., Buffalo, N. Y.
Wm. Wharton, Jr. & Co., Inc., 30 Church St., New York, N. Y.

FORGINGS, Special

Gulf Coast Machine & Supply Co., Beaumont, Texas.

FORMS, Concrete

Finucane Boiler Works, Houston, Texas.
George W. Smith Co., Dallas, Tex.

FOUNTAINS, Drinking

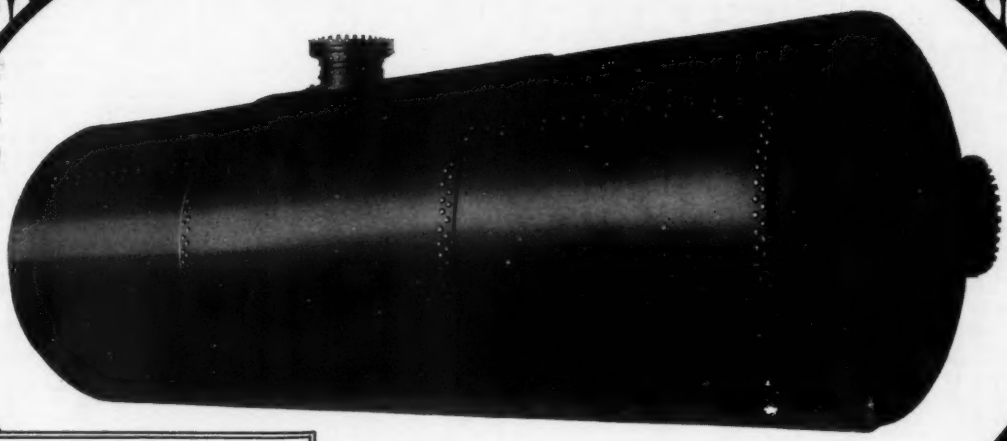
Audiffren Refrigerating Machine Co., 285 Madison Ave., New York, N. Y.

FRACTIONATORS

BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Ca. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WINKLER & KOCH, 429 First National Bank, Wichita, Kansas. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
Cross Engineering Co., 700 Maltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio

STRUTHERS-WELLS Steel Plate Construction



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FRONTS, Boilers

Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Lamprey Co., Westfield, Mass.
A. D. Granger Co., 15 Park Row, New York, N. Y.

FRONTS, Still

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

McEwen Bros., Wellsville, N. Y.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Myerston Foundry & Mfg. Co., 90 West St., New York, N. Y.

FURNACES

B. P. LIENTZ & CO., Kansas City, Mo. See Advertisers' Index.
PLIBRICO JOINTLESS FIRE BRICK CO., 1130 Clay St., Chicago, Ill. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.
WINKLER & KOCH, 429 First National Bank, Wichita, Kansas. See Advertisers' index.

American Chimney Corp., 147 Fourth Ave., New York, N. Y.
American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Burke Engineering Co., Holland, Mich.
Drake Non-Clinkering Furnace Block Co., 5 Beekman St., New York, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Gas Combustion Co., P. O. Box 1753, Pittsburgh, Pa.
Gilbert & Barker Mfg. Co., Springfield, Mass.
George J. Hagan Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
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M. A. Hofft Co., Indianapolis, Ind.
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Sprague Foundry & Mfg. Co., P. O. Box 334, Council Bluffs, Iowa
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FURNACES, Boiler

PLIBRICO JOINTLESS FIRE-BRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.

American Chimney Corp., 147 Fourth Ave., New York, N. Y.
American Engineering Co., Philadelphia, Pa.
American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.
Bernitz Furnace Appliance Co., 80 Federal St., Boston, Mass.
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Burke Engineering Co., Holland, Mich.
Drake Non-Clinkering Furnace Blk Co., 5 Beekman St., New York N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erie City Iron Works, Erie, Pa.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Freeman Mfg. Co., Racine, Wis.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
M. A. Hofft Co., Indianapolis, Ind.
International Heater Co., 101 Park Ave. Utica, N. Y.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McLeod & Henry Co., Troy, N. Y.
Quinn & Co., 1347 Harrison Ave., Cincinnati, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Union Iron Works, Selma, Ala.
Howard J. Webster, Harrison Bldg., Philadelphia, Pa.
Wellsville Fire Brick Co., Wellsville, Mo.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

FURNACES, Carborundem

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.

FURNACES, Industrial

The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.

FURNACE WALLS

PLIBRICO JOINTLESS FIRE-BRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y. See Advertisers' Index.
GEO. P. REINTJES CO., 2517-19 Jefferson St., Kansas City, Mo. See Advertisers' Index.

Burke Engineering Co., Holland, Mich.
M. H. Detrick Co., 140 So. Dearborn St., Chicago, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
McLeod & Henry Co., Troy, N. Y.
S. Obermayer Co., 2563 W. 18th St. Chicago. Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Perolin Co. of America, 2012 People's Gas Bldg., Chicago, Ill.
Quinn & Co., 1347 Harrison Ave., Cincinnati, Ohio
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.
Waite & Davey Co., Inc., 5 Court Square, Long Island City, N. Y.

FURNITURE, Drafting Room

WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
New York Blue Print Paper Co., 102 Reade St., New York, N. Y.
New York Machinery Co., 200 Fifth Ave., New York, N. Y.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
United Alloy Steel Corp., Canton, Ohio.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

G

GAS, Acetylene

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Davis Bouronville Co., 141-43 W. Austin Ave., Chicago, Ill.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Magnoila Gas Porducts Co., Houston, Tex.

GAS, Oxygen and Hydrogen

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carbic Mfg. Co., Duluth, Minn.
Carbo-Hydrogen Co. of America, Benedum-Trees Bldg., Pittsburgh, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Davis Bouronville Co., 141-43 W. Austin Ave., Chicago, Ill.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Magnoila Gas Porducts Co., Houston, Tex.
National Oxygen Co., 5811 W. 66th St., Chicago, Ill.

GAS, Welding

Linde Air Products Co., 30 E. 42nd St., New York, N. Y.

GASKETS, Air

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZ GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
McCORD RADIATOR & MFG. CO., 2587 E. Grand Blvd., Detroit, Mich. See Advertisers Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GASKETS, Aluminum

GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago Ill. See Advertisers' Index.
McCORD RADIATOR & MFG. Co., 2587 E. Grand Blvd., Detroit, Mich. See Advertisers' Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
R. V. Aycock Co., Kansas City, Mo.
Cincinnati Gasket and Packing Co., 1546-48 Elm St., Cincinnati, O.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Rogers Asbestos Co., Houston, Texas.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GASKETS, Ammonia

YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

GASKETS, Asbestos

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
McCORD RADIATOR & MFG. CO., Detroit, Mich. See Advertisers' Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Acme Asbestos Cov. & Supply Co., 242 N. Elizabeth St., Chicago, Ill.
Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
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La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
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National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Oil Well Supply Co., Pittsburgh, Pa.
Republic Rubber Co., Youngstown, Ohio
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Witherup Cork Packing Co., Beaumont, Texas.

GASKETS, Boiler

GARLOCK PACKING CO., 50 Main St. Palmyra, N. Y. See Advertisers' Index.

STOP PIPE CORROSION
IN SMALL LINES

Our Simplex Prepared Joint Cast Iron Pipe is made in 2", 3", 4" or 6" diameters. Since it has been available thousands and thousands of feet of this material has been used in the oil fields.

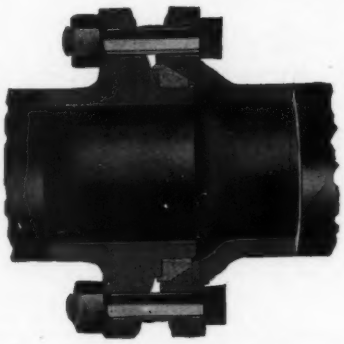

Illustration of section through assembled joint of Simplex Prepared Joint Five-Foot pipe, showing asbestos endless ring gasket in place. This gasket is adapted to use for oil, vapor and acid lines. A rubber gasket is compounded to suit the particular service it is to render—steam, natural gas, artificial gas, water, oil, etc.

Its chief advantage lies in its immunity from corrosion as compared with other ferrous pipe. Its desirability is further increased by the special joint, with only two bolts, and with a thick, endless ring gasket. It is rapidly and easily laid by inexperienced men.

Wherever permanent construction is desired, it is little short of an economic crime to spend money for a pipe line of perishable material when a practically permanent construction can be obtained by the use of cast iron.

Do you know why cast iron withstands corrosion so much better than any other ferrous metal? Our Bulletin No. 44 explains it.

Simplex Prepared Joint Pipe is furnished with full line of fittings. The material is fully described and illustrated in our Catalog No. 48. Your copy is waiting to be mailed upon receipt of your request.

American Cast Iron Pipe Company

General Offices and Foundry: Birmingham, Ala.

Branches at
Dallas, Kansas City, San Francisco, Los Angeles, Chicago, New York, Minneapolis

Write Also for Information on Our
Simplex Cast Iron Pipe for Oil Condensers

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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

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R. V. Aycock Co., Kansas City. Mo.
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Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
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Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
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Jenkins Bros., 80 White St., New York, N. Y.
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New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Cal'f.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
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Texas Belting Co., Houston, Texas.
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GASKETS, Cork

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METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.

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Armstrong Cork & Insulation Co., Pittsburgh, Pa.
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Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Illinois Glass Co., Alton, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Witherup Cork Packing Co., Beaumont, Texas.

GASKETS, Corrugated Copper

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Edison Packing & Sales Co., 234 State St., Boston, Mass.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
United States Mineral Wool Co., 280 Madison Ave., New York, N. Y.

GASKETS, Double Fold

La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.

GASKETS, Felt

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Booth Felt Co., Inc., 463-473 Nineteenth St., Brooklyn, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Monarch Belting Co., 1270 Ontario St., Cleveland, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GASKETS, Handhole

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R. V. Aycock Co., Kansas City, Mo.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
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Texas Belting Co., Houston, Texas.
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GASKETS, Manhole

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Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GASKETS, Oil

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Diamond Rubber Co., Inc., Akron, Ohio.
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Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
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Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
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Jenkins Bros., 80 White St., New York, N. Y.
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La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
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Union Iron Works, Selma, Ala.
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Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
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Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
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GASKETS, Oil

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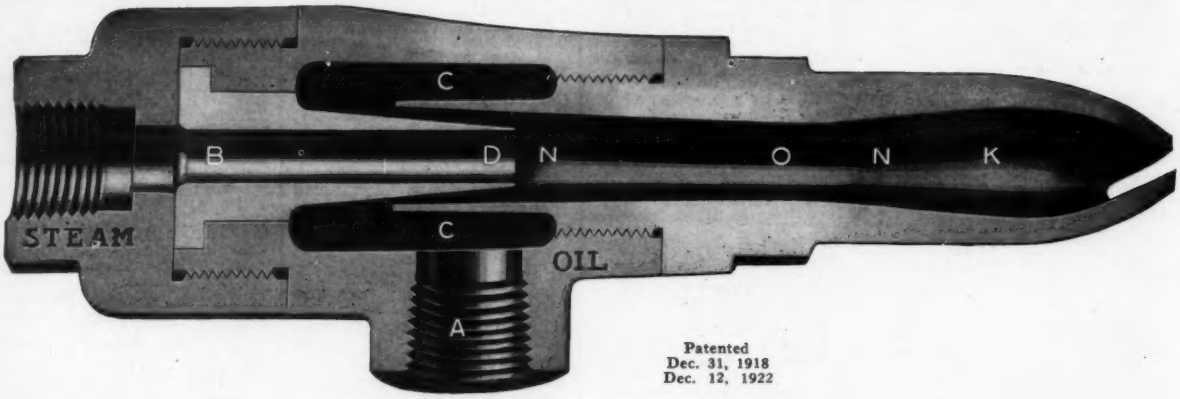
National Airoil Burners



Patented
Dec. 31, 1918
Dec. 12, 1922

For Power Plants and Stills

NATIONAL AIROIL BURNERS are internal atomizing burners—inside mixers—operating with either steam or compressed air; and burn as steady as a gas flame with any grade of fuel. Set your fire the way you want it, and it will burn the day through without watching or readjusting.

No smoke.

No carbon deposit.

No flare-back or back fire.

No clogging. The oil is mixed with steam inside the burner before being fed into the furnace, and cannot clog.

NATIONAL AIROIL BURNERS will handle the heavy residuum from cracking stills without requiring continual removal for cleaning, an immense factor in economical plant operation.

NATIONAL AIROIL BURNERS require less excess air, and obtain maximum efficiency because of the thorough atomization of the oil inside the burner before it is fed into the fire.

NATIONAL AIROIL BURNERS give a soft gaseous flame that does not injure brick work or boiler tubes. Made with flat or round tips.

Write for our Bulletin No. 21

National Airoil Burner Company

S. W. Cor. 9th and Thompson Sts., Philadelphia, Pa.

Oil Burners and Oil Burning Equipment

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GASKETS, Paper

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Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
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Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GASKETS, Rubber

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Black, Sivalls & Bryson, Bartlesville, Okla.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Glasgow Iron Co., Pottstown, Pa.
B. F. Goodrich Rubber Co., Akron, Ohio
Gutta Percha & Rubber Co., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
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La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Miller Rubber Co. of New York, Akron, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Republic Rubber Co., Youngstown, Ohio
Sculley Steel & Iron Co., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Union Iron Works, Selma, Ala.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Voorhees Rubber Mfg. Co., 20 Bostwick Ave., Jersey City, N.J.

GASKETS, Steam

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METALLO GASKET CO., New Brunswick. N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

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Austin-Mason Co., 15 Park Row, New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Crandall Packing Co., Palmyra, New York
Diamond Rubber Co., Inc., Akron, Ohio.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
"Flexitallic" Gasket Co., Camden, N. J.
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
B. F. Goodrich Rubber Co., Akron, Ohio
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Union Iron Works, Selma, Ala.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Witherup Cork Packing Co., Beaumont, Texas.

GASKETS, Vulvanized Fibre

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Stewart R. Browne Mfg. Co., New York, N. Y.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Gasket Supply Co., 1729 Ludlow St., Philadelphia, Pa.
Lake Erie Mfg. Co., Inc., 192-198 Chicago St., Buffalo, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

GAUGES, Air

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Ashcroft Manufacturing Co., New York, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Brunner Mfg. Co., Utica, N. Y.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Equitable Meter and Mfg. Co., 422-434-444 First Ave., Pittsburgh, Pa.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Griebel Instrument Co., Carbondale, Pa.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Gauge Co., 300 Pacific St., Brooklyn, N. Y.
National Gauge & Equipment Co., La Crosse, Wisconsin.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
United States Gauge Co., 44 Beaver St., New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.

GAUGES, Ammonia

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City Mo. See Advertisers' Index.
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YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

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Ashcroft Manufacturing Co., New York, N. Y.
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Arctic Ice Machine Co., Canton, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Carbondale Machine Co., Carbondale, Pa.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
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Plouff Co., 170 Summer St., Boston, Mass.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
John Simmons Co., 104-10 Center St., New York, N. Y.
United States Gauge Co., 44 Beaver St., New York, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
York Products Corporation, Houston, Texas.

GAUGES, Automatic Tank

OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio, See Advertisers' Index.

GAUGES, Draft

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 328½ Monroe Street, Ft. Worth, Texas, See Advertisers' Index.

FOXBORO COMPANY, Naponset Ave., Foxboro, Mass., See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio., See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Lewis M. Ellison, 214 W. Kinzie St., Chicago, Ill.
Griebel Instrument Co., Carbon dale, Pa.
The Hays Corporation, Michigan City, Ind.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
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Taylor Instrument Co., Rochester, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.

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GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
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MERIAM CO., 8405 Detroit Ave., Ave., Cleveland, Ohio, See Advertisers Index.
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NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WESTCOTT & GRIES, INC., Tulsa, Okla. See Advertisers Index.

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Ashcroft Manufacturing Co., New York, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Griebel Instrument Co., Carbon dale, Pa.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Manning Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Gauge Co., 300 Pacific St., Brooklyn, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
United States Gauge Co., 44 Beaver St., New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.

GAUGES, Liquid Level

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
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FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St. Brooklyn, N. Y.
Arctic Ice Machine Co., Canton, Ohio
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Continental Supply Co., St. Louis, Missouri
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Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Essex Brass Corp., 200 Franklin St., Detroit, Mich.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Griebel Instrument Co., Carbondale, Pa
W. & L. E. Gurley, Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Northern Tool Co., Inc., 806 Union St., Utica, N. Y.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Pneumercator Co., 40 Flatbush Ave., Extension, Brooklyn, N. Y.
Republic Flow Meter Co., 2236 Diversey Parkway, Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

GAUGES, Low Pressure

THE FOXBORO CO., INC., Foxboro, Mass. See Advertisers' Index.

GAUGES, Mercury Tank

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
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O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Plouff Co., 170 Summer St., Boston, Mass.
Pneumercator Co., 40 Flatbush Ave., Extension, Brooklyn, N. Y.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.

GAUGES, Oil

THE BRISTOL CO., Waterbury, Conn., See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
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National Gauge Co., 300 Pacific St., Brooklyn, N. Y.
National Gauge & Equipment Co., La Crosse, Wisconsin.
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THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio, See Advertiser's Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
MODERN ENGINEERIRNG CO., 3411-13 Pine Blvd., St. Louis, Mo. See Advertisers' Index.
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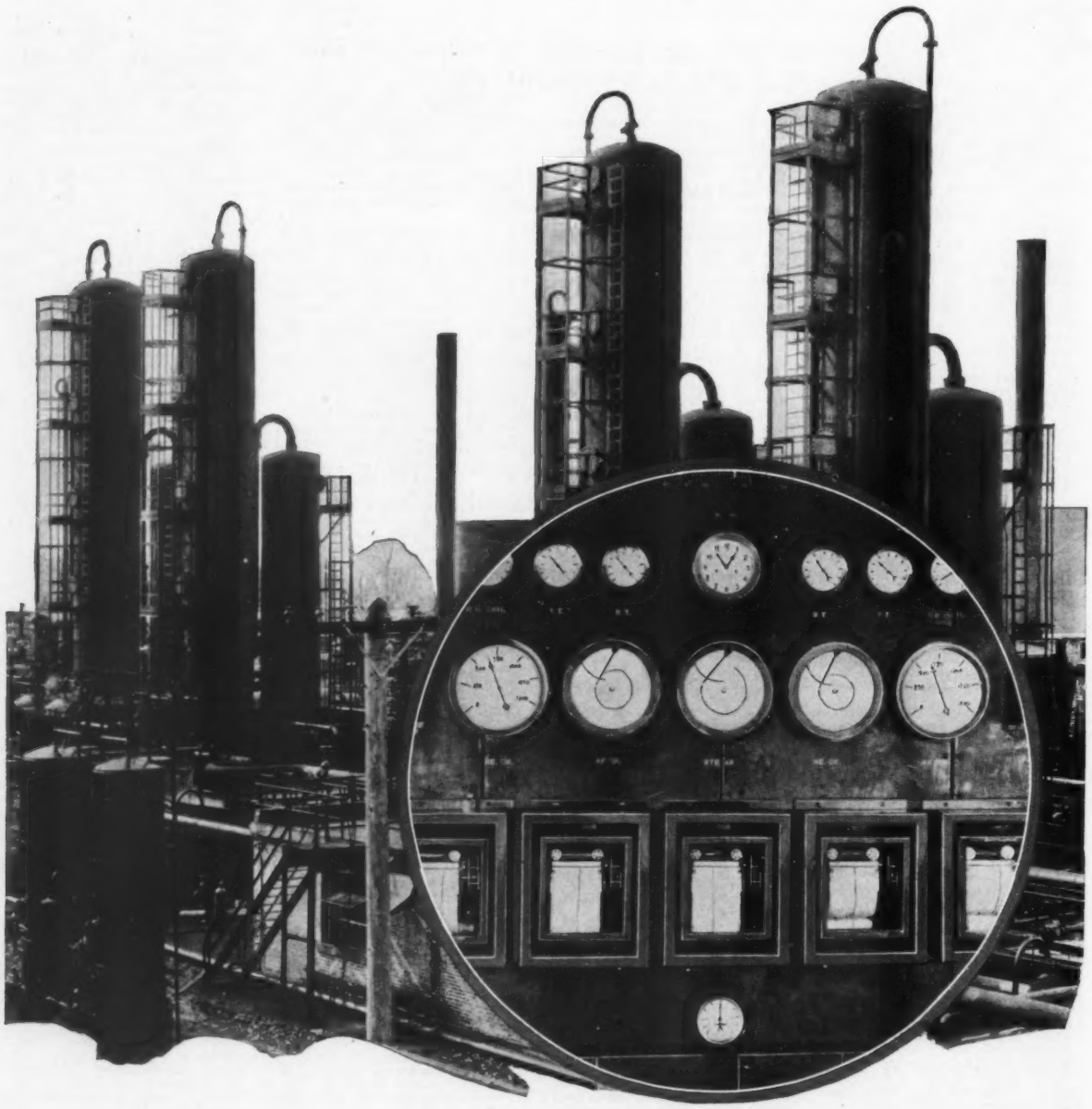

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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.

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OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

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Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Connelly Iron Sponge & Governor Co., 14th St. & Marion Pl., Long Island City.
Continental Supply Co., St. Louis, Louisiana St., Houston, Texas. See page 160.
Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.
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National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
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FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.

THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.

METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.

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WESTCOTT & GRIES, INC., Tulsa, Okla. See Advertisers' Index.

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Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Equitable Meter and Mfg. Co., 422-434-444 First Ave., Pittsburgh, Pa.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Griebel Instrument Co., Carbondale, Pa.
International Heater Co., 101 Park Ave. Utica, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
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Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.
United States Gauge Co., 44 Beaver St., New York, N. Y.

GAUGES, Water

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

METRIC METAL WORKS OF AMERICAN METER CO., Erie, Pa. See Advertisers' Index.

NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

SOUTHERN CORNICE WORKS 116 S. Cincinnati, Tulsa, Okla. See Advertisers' Index.

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
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Continental Supply Co., St. Louis, Mo.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
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Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
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Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Griebel Instrument Co., Carbondale, Pa.
Heine Boiler Co., 5319 Marcus Ave., St. Louis Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 So. 18th St., Philadelphia, Pa.
International Heater Co., 101 Park Ave. Utica, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Lunkenheimer Co., Cincinnati, Oo.
Marion Machine Foundry & Supbell Ave., Detroit, Mich.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., 3643 Blanbien St., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Northern Tool Co., Inc., 806 Union St., Utica, N. Y.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Penberthy Injector Co., 340 Holder Ave., Detroit, Mich.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.
Rich Mfg. Co., 370 Atlantic Ave., Boston, Mass.
Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
The J. E. Shaffer Co., 315 Mid-Continent Blg., Tulsa, Okla.
Simplex Valve & Meter Co., 2005 S 68th St., Philadelphia, Pa.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
Union Iron Works, Selma, Ala.
Williams Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

GAUGES, Water Level

THE BRISTON CO., Waterbury, Conn. See Advertisers' Index.

GAUGE GLASSES

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.

MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio. See Advertisers' Index.

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American Lubricator Co., Detroit, Mich.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Ashcroft Manufacturing Co., New York, N. Y.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, O.
Connelly Iron Sponge & Governor Co., 14th St. & Marion Pl., Long Island City.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Equitable Meter and Mfg. Co., 422-434-444 First Ave., Pittsburgh, Pa.
Erie City Iron Works, Erie, Pa.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Griebel Instrument Co., Carbondale, Pa.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 So. 18th St., Philadelphia, Pa.
Illinois Glass Co., Alton, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Penberthy Injector Co., 340 Holden Ave., Detroit, Mich.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland, Ohio.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
Texas Belting Co., Houston, Texas.
Union Iron Works, Selma, Ala.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.

GEARS

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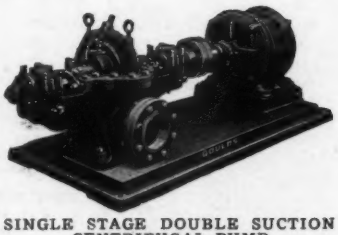
A Complete Pumping Service for the Natural Gasoline Plant

Pumps for: High and Low Pressure Gasoline and Naphtha Work—Spray and Respray Service—Charging and Feeding Stills—Circulating Cooling Water for Engines, Compressors and Condensers.



SINGLE STAGE DOUBLE SUCTION CENTRIFUGAL PUMP
Figs. 3065, 3075, 3085, 3095
For condenser service, gas engine and compressor jacket cooling in both compression and absorption plants

Send for these special oil pump bulletins.

To provide accurate data showing the adaptability of Goulds Pumps for pumping oils, GOULDS PUMPS, Inc., in collaboration with the Union Oil Co., conducted a series of tests in the Los Angeles Refinery of the above Company. The results of these tests are given in two reports by Prof. Robert L. Daugherty:

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"Petroleum Industry and Pumps Used," printed by Lefax, summarizes the uses for pumps for pipe line, refinery and natural gasoline plant services.

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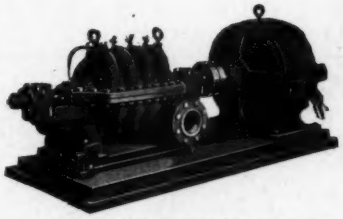
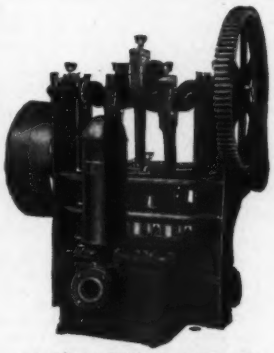
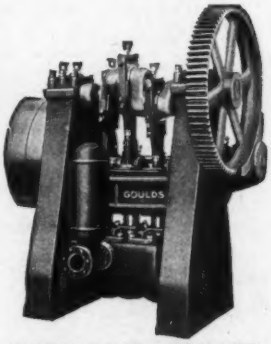


MULTI-STAGE CENTRIFUGAL PUMP
Fig. 3330
For main charging in absorption plants

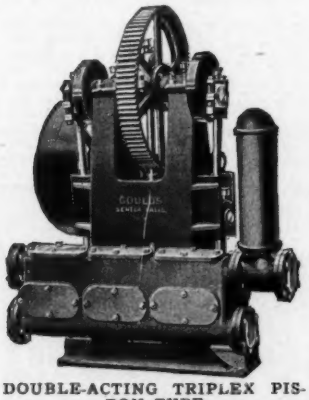


SINGLE-ACTING TRIPLEX PLUNGER TYPE
Fig. 1696
For main charging in absorption plants

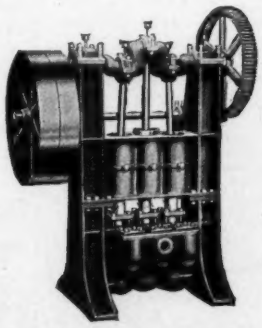
DOUBLE-ACTING SINGLE CYLINDER TYPE
Fig 1531
For naphtha and gasoline low pressure work in compression plants. Pressures up to 75 lbs.



SINGLE-ACTING TRIPLEX PRESSURE PUMP
Type of Fig. 997-E and Fig 1671
For high pressure gasoline work in compression plants



DOUBLE-ACTING TRIPLEX PISTON TYPE
Fig. 1357
Naphtha and gasoline Transfer Pumps in compression plants. Pressures 75 to 125 lbs.



PRESSURE PUMP—SINGLE-ACTING TRIPLEX TYPE
Fig. 1713
For high pressure naphtha work in compression plants. Pressures up to 750 lbs.

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Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

GOVERNORS, Burner

G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

GOVERNORS, Engine

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GOVERNORS, Gas

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FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Connelly Iron Sponge & Governor Co., 14th St. & Marion Pl., Long Island City.
Gardner-Governor Co., Quincy, Ill.
Judson Governor Co., Rochester, New York.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
H. Mueller Mfg Co., Decatur, Ill.
The P. H. & F. M. Roots Co., Connersville, Ind.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

GOVERNORS, Pump

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE CHAPLIN-FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.

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Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Julian d'Este Co., 26 Canal St., Boston, Mass.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Gardner-Governor Co., Quincy, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 So. 18th St., Philadelphia, Pa.
Jarecki Mfg. Co., Erie, Pa.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
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—FOR NATURAL GASOLINE PLANTS
—WILL NOT CORRODE

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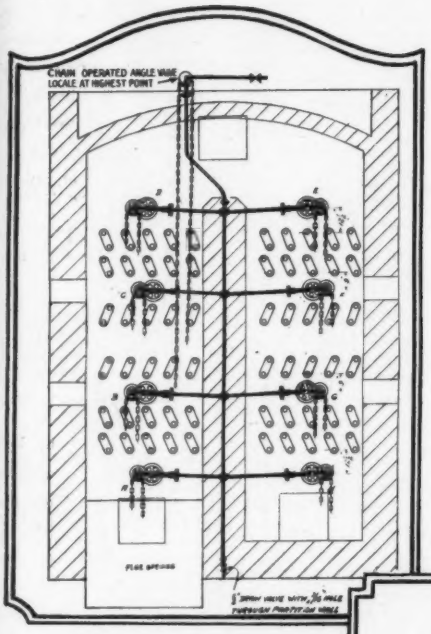
The Youngstown Boiler & Tank Co., Youngstown, Ohio

HEATERS, Air

BABCOX & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

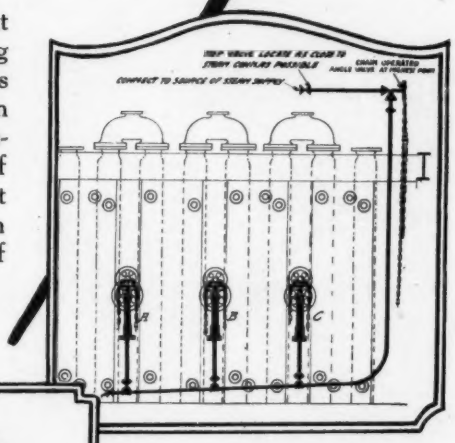
The Air Preheater Corp., 25 Broadway, New York, N. Y.
The Badenhausen Corp., 1011 Chestnut St., Philadelphia, Pa.
Bayley Mfg. Co., 73z Greenbush St., Milwaukee, Wis.
Carlton-Mace Eng. Corp., 10 High St., Boston, Mass.
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Garden City Fan Co., McCormick Bldg., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
MacLeod Company, Cincinnati, Ohio
Maxon Premix Burner Co., Muncie, Ind.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.

What Diamond Soot Blowers *mean to the* Oil Refiner

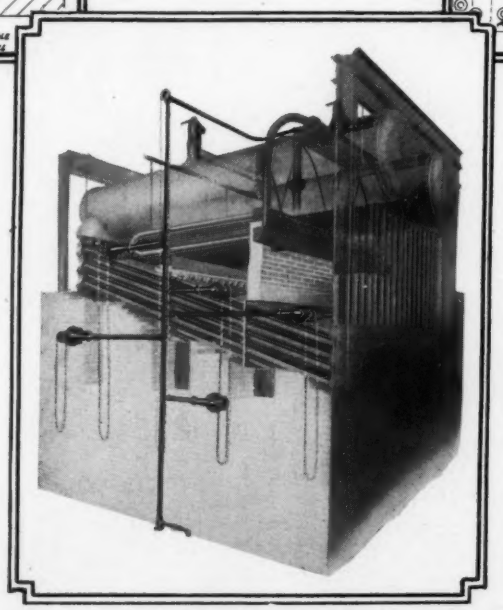


OIL HEATER

Soot is the best heat insulator known, being more than five times as effective as asbestos in preventing heat transference. One inch of asbestos would let through more heat than one-fifth of an inch of soot.



OIL PREHEATER



You can't burn either oil or coal without getting soot on the tubes of your oil heaters, preheaters and steam boilers. Keep this soot off by a thorough mechanical system of soot removal, operating at regular intervals, and you will save 4 to 8 per cent or more of your fuel. You will also save labor, maintenance, equipment shutdowns, and increase the capacity of your equipment.

Diamond Soot Blowers are the product of over twenty years combustion engineering experience. Over ten million horsepower of boilers are equipped in the United States alone. Progressive oil refiners are finding that they save a great deal of money on their stills and oil heaters, as well as on their boilers. Let us tell you about the installations already made and being made in the oil field.

Ask for Bulletin 590.

Diamond Power Specialty Corporation

DETROIT, MICHIGAN

Mention Where You Saw the Advertisement

Stickle Steam Specialties Co., Indianapolis, Ind.
Tennant Co., Union National Bank Bldg., Houston, Texas.

HEATERS, Electric

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carleton Mace Engr. Co., 244 Dover St., Boston, Mass.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Langstadt-Meyer Co., Appleton, Wis.
National Electric Heating Co., 10 High St., Boston, Mass.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Utility Mfg. Co., Cudahy, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

HEATERS, Feed Water

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
Bates Manufacturing Co., 710 Henderson Ave., Joliet, Ill.
Bay State Belting Co., 349 Congress St., Boston, Mass.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
The Brownell Co., Dayton, Ohio
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
Frost Mfg. Co., Galesburg, Ill.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Marshall Heater Co., 724 E. Monument Ave., Dayton, Ohio.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Moffat Feed Water Heater & Purifier Co., 724 E. Monument Ave., Dayton, Ohio.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
National Electric Heating Co., 10 High St., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Patterson-Kelley Co., 101 Park Ave., New York, N. Y.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sims Co., Erie, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Stanwood Corp., Cincinnati, O.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Tsermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Warren Webster & Co., Camden, N. J.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Whitlock Coil Pipe Co., Hartford, Conn.

HEATERS, Feed Water Closed

BIGGS BOILER WORKS CO., Case Ave. and Newton St., Akron, Ohio. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
The Brownell Co., Dayton, Ohio
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Patterson-Kelley Co., 101 Park Ave., New York, N. Y.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sims Co., Erie, Pa.
The Stanwood Corp., Cincinnati, O.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarritt Bldg., KansasCity, Mo.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.
East Pittsburgh, Pa.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Whitlock Coil Pipe Co., Hartford, Conn.

HEATERS, Feed Water Open

ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
POWER PLANT SPECIALTY CO., 440 So. Dearborn St., Chicago, Ill. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
Bates Manufacturing Co., 710 Henderson Ave., Joliet, Ill.
The Brownell Co., Dayton, Ohio
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hartwell Iron Works, Houston, Texas
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Filter Co., 335 W. Twenty-Fifth Place, Chicago, Ill.
Linton Machine Co., 101 Park Ave., New York, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Marshall Heater Co., 724 E. Monument Ave., Dayton, Ohio.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Moffat Feed Water Heater & Purifier Co., 724 E. Monument Ave., Dayton, Ohio.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Patterson-Kelley Co., 101 Park Ave., New York, N. Y.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sims Co., Erie, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Stanwood Corp., Cincinnati, O.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarrit Bldg., Kansas City Mo.
Warren Webster & Co., Camden, N. J.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.

HEATERS, Oil

GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

HEATERS, Fuel Oil

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
MacLeod Company, Cincinnati, Ohio
Maxon Premix Burner Co., Muncie, Ind.
National Electric Heating Co., 10 High St., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Patterson-Kelley Co., 101 Park Ave., New York, N. Y.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sims Co., Erie, Pa.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Titusville Iron Works, Titusville, Pa.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.
Whitlock Coil Pipe Co., Hartford, Conn.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

HEATERS, Tank

Geo. A. Weld & Co., 80 Federal St., Boston, Mass.

HEATERS, Water Supply

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.
American District Steam Co., N. Tonawanda, N. Y.
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Cochrane Corp., 17th and Clearfield Sts., Philadelphia, Pa.

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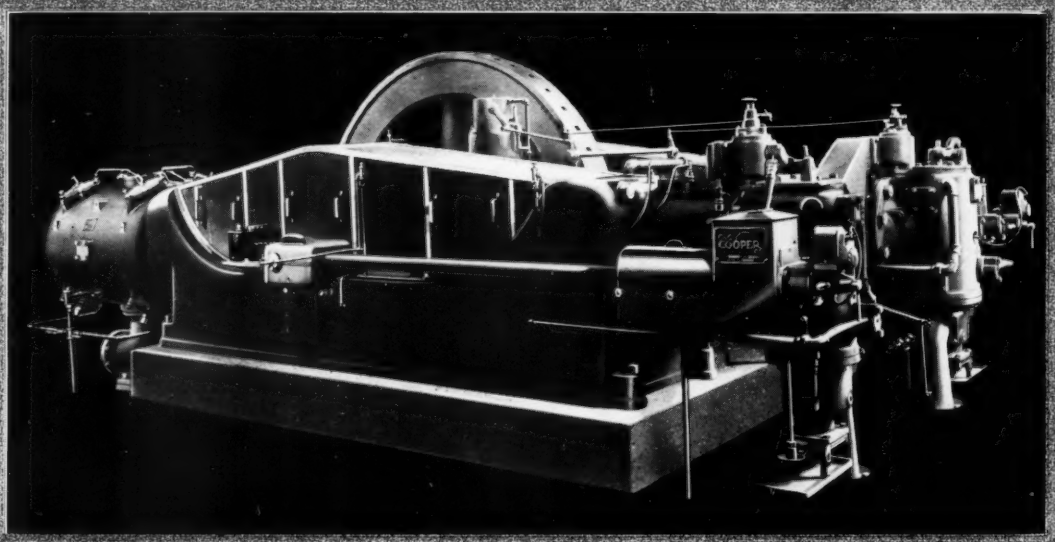


THE COOPER "TYPE 80" GAS ENGINE DRIVEN COMPRESSOR

Built in two sizes 85 B. H. P. as a single side and 170 B. H. P. as a twin unit. All corresponding parts on the single and the twin are interchangeable except the crank shaft.

These direct driven compressor units are used by so many of the larger oil and gas companies in such numbers that they are built on a quantity production basis and can usually be shipped from stock. Such production has made possible the use of drop forgings, die castings, and alloy steels. These, together with the improved design of both engines and compressors, result in users getting the greatest value for their investment.

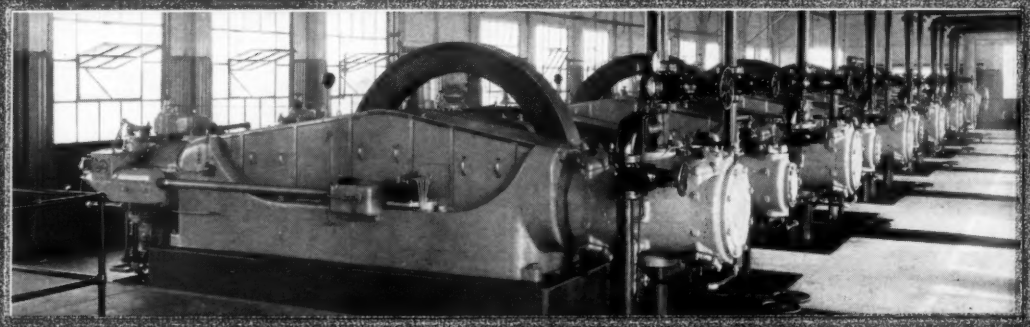
The engine without the compressor built with a special frame, is used for direct driving electric generators or for belt driving pumps, line shafts and other machinery.

THE C. & G. COOPER COMPANY

MOUNT VERNON, OHIO

1605 Kirby Building, Dallas — 604 Kennedy Building, Tulsa

649 S. Olive St., Los Angeles



COOPER "TYPE-19"

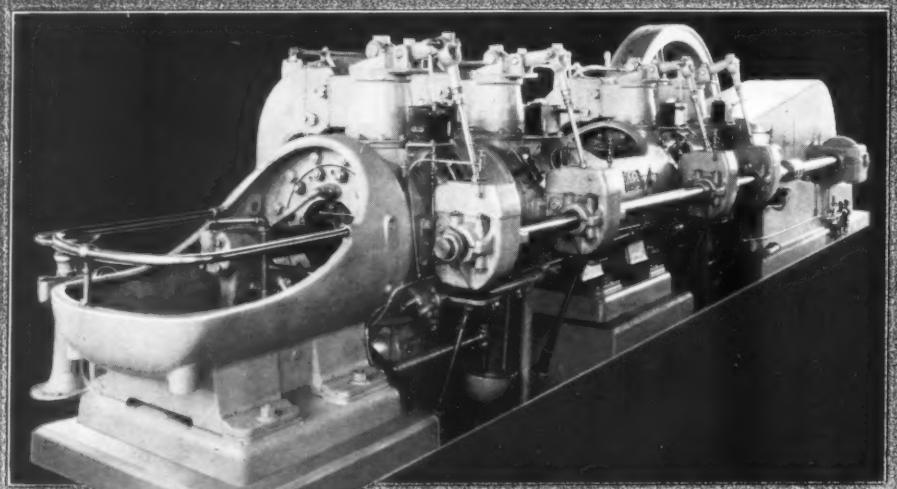
This is a double-acting gas engine designed especially for the strenuous service imposed by continuous compressor loads where units of 200 B. H. P. and larger are desired. It is built as single cylinder 200 H. P.; twin cylinder 400 H. P.; single tandem 380 H. P. and twin tandem 760 H. P. units.

The installation above shows three of the 760 H. P. twin tandem units direct driving gas compressors in Midway Gas Company's Ventura, California, station.

This same general design is built with larger cylinders in sizes up to 1500 B. H. P. They are being used for driving electric generators and for every power purpose.

You eliminate all chance of disappointment when you select Cooper gas engines and compressors. They are built and guaranteed by a company that has been building engines for 94 years—almost a century.

THE C. & G. COOPER COMPANY
MOUNT VERNON, OHIO
1605 Kirby Building, Dallas 604 Kennedy Building, Tulsa
649 S. Olive St., Los Angeles



Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
A. D. Granger Co., 15 Park Row, New York, N. Y.
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International Heater Co., 101 Park Ave. Utica, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kewanee Boiler Co., Kewanee, Ill.
Keystone Boiler & Foundry Co., Landisville, Pa.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.
Marshall Heater Co., 724 E. Monument Ave., Dayton, Ohio.
National Electric Heating Co., 10 High St., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Patterson-Kelley Co., 101 Park Ave., New York, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sims Co., Erie, Pa.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Tirrill Gas Machine Lighting Co., 50 Church St., New York, N. Y.
Titusville Iron Works, Titusville, Pa.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.
Whitlock Coil Pipe Co., Hartford, Conn.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

HEATING, Apparatus

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
The American Blower Co., 6004 Russell, Detroit, Mich.
American District Steam Co., N. Tonawanda, N. Y.
Bayley Mfg. Co., 73z Greenbush St., Milwaukee, Wis.
The Buckeye Blower Co., Town & Lucas Sts., Columbus, Ohio.
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Garden City Fan Co., McCormick Bldg., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York, N. Y.
Illinois Engineering Co., Racine Ave & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
E. Keeler Co., Williamsport, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kewanee Boiler Co., Kewanee, Ill.
Keystone Boiler & Foundry Co., Landisville, Pa.
Lamprey Co., Westfield, Mass.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
National Electric Heating Co., 10 High St., Boston, Mass.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stickle Steam Specialties Co., Indianapolis, Ind.

B. F. Sturtevant Co., Hyde Park, Boston, Mass.
Warren Webster & Co., Camden, N. J.

HEATING, Systems

ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
The American Blower Co., 6004 Russell, Detroit, Mich.
American District Steam Co., N. Tonawanda, N. Y.
Autovent Fan & Blower Co., 730-38 W. Monroe St., Chicago, Ill.
Bayley Mfg. Co., 73z Greenbush St., Milwaukee, Wis.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
The Buckeye Blower Co., Town & Lucas Sts., Columbus, Ohio.
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
Carrier Engineering Corp., 750 Frelinghuysen Ave., Newark, N. J.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Gorton & Lidgerwood Co., 96 Liberty St., New York, N. Y.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Keystone Boiler & Foundry Co., Landisville, Pa.
Lamprey Co., Westfield, Mass.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
H. Mueller Mfg Co., Decatur, Ill.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stickle Steam Specialties Co., Indianapolis, Ind.
Trane Co., LaCrosse, Wis.
Warren Webster & Co., Camden, N. J.

HELMETS, Sandblasting

PULMOSAN SAFETY EQUIPMENT CO., 45 Willoughby St., Brooklyn, New York. See Advertisers' Index.

HOISTS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Engineering Co., Philadelphia, Pa.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Charles Bond Co., 617-619 Arch St., Philadelphia, Pa.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
Domestic Engine & Pump Co., Shippensburg, Pa.
Equitable Equipment Co., Inc., New Orleans, La.
R. B. Everett Co., Houston, Texas
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hanna Engineering Works, 1769 Elston Ave., Chicago, Ill.
Hoist & Crane Eng. Co., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.

Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Llewellyn Iron Works, N. Main & Redondo, Los Angeles, Calif.
National Supply Co., Toledo, Ohio
Novo Engine Co., Lansing, Mich.
Oil Well Supply Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Wellman-Seaver-Morgan Co., 7000 Central Ave., Cleveland, Ohio.
Western Machinery Co., Los Angeles, Calif.

HOISTS, Portable

Sullivan Machinery Co., 122 S Michigan Ave., Chicago, Ill.

HOISTS, Skip

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

HOODS, Acid

PULMOSAN SAFETY EQUIPMENT CO., 45 Willoughby St., Brooklyn, N. Y. See Advertisers' Index.

The Alcumite Corporation, Dayton, Ohio.
E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.

HOOKS, Belt

Chicago Belting Co., 125 N. Green St., Chicago, Ill.
R. & J. Dick Co., Inc., Passaic, N. J.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Grand Rapids Belting Co., 1-3 Ionia Ave., Grand Rapids, Mich.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
The N. Palmer Belting Co., Bridgeport, Conn.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
J. S. Turner Mfg. Co., 133 Middle St., P. O. Box 1072, Lowell, Mass.

HOOKS, Packing

Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

HOPPERS, Storage

HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
NORTH AMERICAN CAR Co., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Green Engineering Co., E. Chicago, Ind.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Union Engineering Co., Cleveland, Ohio.

The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

HOSE, Air

Brazelton, Wessendorff & Nelms, Houston, Texas.
Brunner Mfg. Co., Utica, N. Y.
May Machinery Co., Second National Bank Bldg., Houston, Tex.

HOSE, Fire

PULMOSAN SAFETY EQUIPMENT CO., 45 Willoughby St., Brooklyn, N. Y. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Austin-Mason Co., 15 Park Row, New York, N. Y.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Supply Co., St. Louis, Missouri
Diamond Rubber Co., Inc., Akron, Ohio.
Globe Automatic Sprinkler Co., 2035 Washington Ave., Philadelphia, Pa.
B. F. Goodrich Rubber Co., Akron, Ohio
Gutta Percha & Rubber Co., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Republic Rubber Co., Youngstown, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

HOSE, Flexible Metal

Atlantic Metal Hose Co., Inc., 351 W. 52d St., New York, N. Y.

HOSE, Oil Pressure

Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J.

HOSE, Paint Spray

Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J.

HOSE, Steel

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.

HOSE, Tank Car

Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J.

HOSE, Water

F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.

HOSE, Welding

Brazelton, Wessendorff & Nelms, Houston, Texas.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

HOUSES, Portable

Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.

HYDRANTS, Fire

Eddy Valve Co., Waterford, N. Y.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Hartwell Iron Works, Houston, Texas
The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas

John Simmons Co., 104-10 Center St., New York, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

HYDROMETERS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORTH WORTH LABORATORIES, 827½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO COMPANY, INC., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
James Berg Mfg. Co., 3707 12th Ave., Brooklyn, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carbondale Machine Co., Carbondale, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
The Emil Greiner Co,, 55 Fulton St., New York City
Griebel Instrument Co., Carbondale, Pa.
The Hays Corporation, Michigan City, Ind.
Langstadt-Meyer Co., Appleton, Wis.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.

HYGRODEIKS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Taylor Instrument Co., Rochester, N. Y.

HYGROMETERS

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Griebel Instrument Co., Carbondale, Pa.
Palo Company, 153 W. 23rd St., New York, N. Y.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
C. L. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.

I

ICE MAKERS

Audiffren Refrigerating Machine Co., 285 Madison Ave., New York, N. Y.

IDLERS, Belt

Baker Ice Machine Co., 3601 Evans St., Omaha, Neb.
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A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
Frick Co., Inc., Waynesboro, Pa.
Fuller-Lehigh Co., Fullerton, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Southern Engine & Pump Co., Houston, Texas
Texas Belting Co., Houston, Texas.
Western Machinery Co., Los Angeles, Calif.

IGNITION

Continental Supply Co., St. Louis, Missouri
Heer Gas & Oil Engine Co., Portsmouth, Ohio.

INCLOSURES, Substation

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.

Columbia Fence & Wire Co., Dallas, Texas

INDICATORS, Combustion

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.

Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Trill Indicator Co., Center St., Corry, Pa.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.

INDICATORS, Engine

THE BRISTOL CO., Waterbury, Conn., See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

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Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
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F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Trill Indicator Co., Center St., Corry, Pa.

INDICATORS, Piston

Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.

INDICATORS, Speed

Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.

INDICATORS, Temperature

THE BRISTOL CO., Waterbury, Conn., See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Charles Englehard, Inc., 30 Church St., New York, N. Y.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
Leeds & Northrup Company, Philadelphia, Pa.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Price Mfg. Co., 12369 Euclid Ave., Cleveland, Ohio.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.

INJECTORS

SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Beck Machine & Boiler Co., Inc. Nacona, Texas.
Continental Supply Co., St. Louis, Missouri
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Eclipse Fuel Engineering Co., Rockford, Ill.
Godfrey, Keeler Co., 70 Warren St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Penberthy Injector Co., 340 Holden Ave., Detroit, Mich.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
The Stanwood Corp., Cincinnati, O.
Union Iron Works, Selma, Ala.

INSTRUMENTS, Drawing

WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Gilson Slide Rule Co., Niles, Mich.
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Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Il.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

INSTRUMENTS, Electrical

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
James G. Biddle, 1211-1213 Arch St., Philadelphia, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Charles Englehard, Inc., 30 Church St., New York, N. Y.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Houston Armature Works, Houston, Texas
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
Jewell Electrical Instrument Co., 1650 Walnut St., Chicago, Ill.
Langstadt-Meyer Co., Appleton, Wis.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Pyrolectric Instrument Co., Easton, Pa.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Wilson Maeulen Co., 383 Concord Ave., New York, N. Y.

INSTRUMENTS, Engineering

FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
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Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Gilson Slide Rule Co., Niles, Mich.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
W. & L. E. Gurley, Troy, N. Y.
The Hays Corporation, Michigan City, Ind.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

INSTRUMENTS, Humidity

THE BRISTON CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carrier Engineering Corp., 750 Frelinghuysen Ave., Newark, N. J.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

INSTRUMENTS, Measuring

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WESTCOTT & GREIS, INC., Tulsa, Okla. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.
Goodell-Pratt Co., 57 Wells St., Greenfield, Mass.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
The Hays Corporation, Michigan City, Ind.
Jewell Electrical Instrument Co., 1650 Walnut St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

INSTRUMENTS, Oil Testing

FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Palo Company, 153 W. 23rd St., New York, N. Y.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.

INSTRUMENTS, Recording

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WESTCOTT & GREIS, INC., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Charles Englehard, Inc., 30 Church St., New York, N. Y.
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Price Mfg. Co., 12369 Euclid Ave., Cleveland, Ohio.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
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Taylor Instrument Co., Rochester, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
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Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.
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Keuffel & Esser Co., Hoboken, N. J.
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Palo Company, 153 W. 23rd St., New York, N. Y.
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Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
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INSULATION, Rock Wool

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National Supply Co., Toledo, Ohio
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Walker Mfg. Co., Fenton, Mich.

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Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.

JOINTS, Swing

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE Co., Oil City, Pa. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index.

American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.
Atlas Valve Co., 282 South St., Newark, N. J.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Continental Supply Co., St. Louis, Missouri
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Lunkenheimer Company, Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

K

KETTLES, Compounding

Leader Iron Works, Decatur, Ill.

KETTLES, Lead Lined, Steam Jacketed

United Lead Co., 111 Broadway, New York, N. Y.

KETTLES, Steam Jacketed

GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

The Alcumite Corporation, Dayton, Ohio.
Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Blaw-Knox Co., Pittsburgh, Pa.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Carleton Mace Engr. Co., 244 Dover St., Boston, Mass.
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
Dover Boiler Works, 50 Church St., New York, N. Y.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.
Kansas City Structural Steel Co., Kansas City, Kansas.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McNamara Brothers Co., Westport, Baltimore, Md.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
R. S. Newbold & Son Co., Norristown, Pa.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
James Papnan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riverside Boiler Works, Inc., 50 Harvard St., Cambridge, Mass.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., North Side, Pittsburgh, Pa.
Samuel Smith & Son Co., Paterson, N. J.
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.
Sprague Foundry & Mfg. Co., P. O. Box 334, Council Bluffs, Iowa
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
Union Engineering Co., Cleveland, Ohio.
Utility Mfg. Co., Cudahy, Wis.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

L

LABORATORY APPARATUS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Audiffren Refrigerating Machine Co., 285 Madison Ave., New York, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
James G. Biddle, 1211-1213 Arch St., Philadelphia, Pa.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.

The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.
Griebel Instrument Co., Carbondale, Pa.
Arthur Harris & Co., 212 Curtis St., Chicago, Ill.
Hoskins Mfg. Co., 4437 Lawton Ave., Detroit, Mich.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Illinois Glass Co., Alton, Ill.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Palo Company, 153 W. 23rd St., New York, N. Y.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelph a Pa.
Precision Scientific Co., 822 S. Tripp Ave., Chicago, Ill.
Premier Mill Corporation, Geneva New York.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.
Tirrill Gas Machine Lighting Co., 50 Church St., New York, N. Y.

LABORATORY SUPPLIES

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia Pa. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Diamond Rubber Co., Inc., Akron. Ohio.
Ellsworth Haning, 114-18 Liberty St., New York, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
H. Mueller Mfg Co., Decatur, Ill.
Palo Company, 153 W. 23rd St., New York, N. Y.
Precision Scientific Co., 822 S. Tripp Ave., Chicago, Ill.
Pyrolectric Instrument Co., Easton Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Truscon Steel Co., Youngstown, O.

LACQUERS, All Purposes

Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

LATHES

Axelson Machine Co., P. O. Box 316, Los Angeles, Calif.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Gisholt Machine Co., Madison, Wis.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
National Supply Co., Toledo, Ohio
Reed-Prentice Co., Worcester, Mass.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
John Steptoe Co., 2960 Colerain Ave.. Cincinnati, Ohio.

LEAD, Solder and Sheet

Continental Supply Co., St. Louis, Missouri
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hoyt Metal Co., Boatman's Bank Bldg., St. Louis, Mo.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, Ohio

LEAD PIGMENTS

The Eagle-Picher Lead Co., 208 S. LaSalle St., Chicago, Ill.

LEATHER, Hydraulic

Stewart R. Browne Mfg. Co., New York, N. Y.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Grand Rapids Belting Co., 1-3 Ionia Ave., Grand Rapids, Mich.
Himmelein & Bailey, Inc., 248 Chestnut St., Philadelphia, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira. N. Y.
E. F. Houghton & Co., Philadelphia, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Edward R. Ladew Co., 29 Murray St., New York, N. Y.
Lawrence Belting Co., Inc., 113 Chambers St., New York, N. Y.
Mabbs Hydaulic Packing Co., 431 S. Dearborn St., Chicago, Ill.
Norwich Belt Mfg. Co., Inc., Norwich, Conn.
Rahmann, Geo., & Co., 31 Spruce St., New York, N. Y.
J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia, Pa.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Schwartz Belting Co., 76 Murray St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Union Belt Co., 66 Troy St., Fall River, Mass.
Warren Belting Co., 33 Artic St., Worcester, Mass.
I. B. Williams & Sons, 9 Orchard St., Dover, N. H.

LEATHER LACE

Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Evansville Leather & Belting Co., 429-431 Sycamore St., Evansville, Ind.
Grand Rapids Belting Co., 1-3 Ionia Ave., Grand Rapids, Mich.
The Graton & Knight Mfg. Co., 356 Franklin St., Worcester, Mass.
Himmelein & Bailey, Inc., 248 Chestnut St., Philadelphia, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
E. F. Houghton & Co., Philadelphia, Pa.
Edward R. Ladew Co., 29 Murray St., New York, N Y.
Lawrence Belting Co., Inc., 113 Chambers St., New York, N. Y.
McCauley Belting Co., 412-430 Orleans St., Chicago, Ill.
Milwaukee Leather Belting Co., 352 E. Water St., Milwaukee. Wis.
Missouri Belting Co., 1021-1028 S. Grand Ave., St. Louis, Mo.
Moloney Belting Co., 130 N. Franklin St., Chicago, Ill.
Monarch Belting Co., 1270 Ontario St., Cleveland, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Norwich Belt Mfg. Co., Inc., Norwich, Conn.
Oil Well Supply Co., Pittsburgh, Pa.
Rahmann, Geo., & Co., 31 Spruce St., New York, N. Y.
J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia, Pa.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Schwartz Belting Co., 76 Murray St., New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Texas Belting Co., Houston, Texas
Union Belt Co., 66 Troy St., Fall River, Mass.
Warren Belting Co., 33 Artic St., Worcester, Mass.
Western Rawhide & Belting Co., 901-35 Winnebago St., Milwaukee, Wis.
I. B. Williams & Sons, 9 Orchard St., Dover, N. H.

LEATHER, Pump

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Avertisers' Index.

Stewart R. Browne Mfg. Co., New York, N. Y.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Himmelein & Bailey, Inc., 248 Chestnut St., Philadelphia, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
E. F. Houghton & Co., Philadelphia, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.
Edward R. Ladew Co., 29 Murray St., New York, N Y.
Lawrence Belting Co., Inc., 113 Chambers St., New York, N. Y.
Mabbs Hydaulic Packing Co., 431 S. Dearborn St., Chicago, Ill.
Milwaukee Leather Belting Co., 352 E. Water St., Milwaukee, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Norwich Belt Mfg. Co., Inc., Norwich, Conn.
J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia, Pa.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Schwartz Belting Co., 76 Murray St., New York, N. Y.
W. T. Shackley & Son, 523 Atlantic Ave., Boston, Mass.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Southern Engine & Pump Co., Houston, Texas
Texas Belting Co., Houston, Texas
Union Belt Co., 66 Troy St., Fall River, Mass.
Warren Belting Co., 33 Artic St., Worcester, Mass.
I. B. Williams & Sons, 9 Orchard St., Dover, N. H.

LIDS, Journal Box

Allegheny Steel Co., Pittsburgh, Pa.

LIGHTING EQUIPMENT

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Beardslee Chandelier Mfg. Co., Chicago, Ill.
Burke Electric Co., Erie, Pa.
Carleton Mace Engr. Corp., 244 Dover St., Boston, Mass.
Langstadt-Meyer Co., Appleton, Wis.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.
The Pyle-National Co., Chicago, Ill.
Southern Engine & Pump Co., Houston, Texas
Universal Motor Co., 39 Ceape St., Oshkosh, Wis.
Western Electric Company, Austin and Wood Sts., Dallas, Texas.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

LIGHTING PLANTS

Langstadt-Meyer Co., Appleton, Wis.

LIGHTS, Carbide

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.

LIGHTS, Feed

Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.

LIGHTS, Flood

Carbic Mfg. Co., Duluth, Minn.
Cook Motor Co., Delaware, Ohio.
General Electric Co., Schenectady, New York
Langstadt-Meyer Co., Appleton, Wis.
MacLeod Company, Cincinnati, Ohio
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
National Supply Co., Toledo, Ohio
The Pyle-National Co., Chicago, Ill.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

LIGHTS, Gauge

Roberts Steam Specialty Co., 5318 St. Clair Ave., Cleveland, Ohio

LIGHTS, Portable

Breeze Metal Hose & Mfg. Co., 22-46 S. 6th St., Newark, N. J.
Carbic Mfg. Co., Duluth, Minn.
Heer Gas & Oil Engine Co., Portsmouth, Ohio.
Langstadt-Meyer Co., Appleton, Wis.
MacLeod Company, Cincinnati, Ohio
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

LIGHTS, Pump

Petroleum Supply Co., Houston, Texas

LIGHTS, Water Gauge

Cleveland Flue Cleaner Mfg. Co., 5318 St. Clair Ave., Cleveland, O.

LINERS, Pump

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa.

Continental Supply Co., St. Louis, Missouri
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelph a Pa.
Republic Rubber Co., Youngstown, Ohio
Southern Brass Mfg. Co., Houston, Texas.

LINING, Flue

W. S. Dickey Clay Mfg. Co., Texarkana, Texas

LININGS, Furnace

BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
CELITE PRODUCTS CO., 1320 S. Hope St., Los Angeles, Cal. See Advertisers' Index.
PLIBRICO JOINTLESS FIREBRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.

Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh. Pa.
McLeod & Henry Co., Troy, N. Y.
Norristown Mangesia & Asbestos Co., Norristown, Pa.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.

LOCKERS

Berger Mfg. Co., Canton, Ohio
Brazelton, Wessendorff & Nelms, Houston, Texas.
Dexter Metal Mfg. Co., 10 So. 18th St., Philadelphia, Pa.
Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Lyon Metallic Mfg. Co., Aurora, Ill.
Fred Medart Mfg. Co., 3535 DeKalb St., St. Louis, Mo.
New York Machinery Co., 200 Fifth Ave.. New York, N. Y.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Terrell's Equipment Co., Grand Rapids, Mich.
United Alloy Steel Corp., Canton, Ohio.

LUBRICATORS, Force Feed

CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
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McCORD RADIATOR & MFG. CO., Detroit, Mich. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Ashcroft Manufacturing Co., New York, N. Y.
Bowen Products Corp'n., Auburn, N. Y.
Bowser, S. F., & Co., Inc., 1230 Bowser Ave., Fort Wayne, Ind.
Continental Supply Co., St. Louis, Missouri
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Heer Gas & Oil Engine Co., Portsmouth, Ohio.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Lunkenheimer Company, Cincinnati, Ohio.
Madison-Kipp Corp., Madison, Wis.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Manzel Bros., Co., 309 to 319 Babcock St., Buffalo, N. Y.
McCullough Mfg. Co., 2632-34 Central Ave., Minneapolis, Minn.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

LUBRICATORS, Graphite

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.

Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Lunkenheimer Company, Cincinnati, Ohio.
National Supply Co., Toledo, Ohio
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

LUBRICATORS, Sight Feed

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
McCORD RADIATOR & MFG. CO., 2587 E. Grand Blvd., Detroit, Mich. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Lubricator Co., Detroit, Mich.
Beck Machine & Boiler Co., Inc., Nacona, Texas.
Bowser, S. F., & Co., Inc., 1230 Bowser Ave., Fort Wayne, Ind.
Continental Supply Co., St. Louis, Missouri
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jarecki Mfg. Co., Erie, Pa.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McCullough Mfg. Co., 2632-34 Central Ave., Minneapolis, Minn.
Michigan Lubricator Co., 3643 Beaubien St., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

LUGS, Boiler

Glasgow Iron Co., Pottstown, Pa.

LUMBER, Hard Asbestos

Philip Carey Co., Cincinnati, Ohio

M

MACHINES, Barrel Washing

WEIMAR ENGINEERING WORKS, Westmoreland & Jasper Sts., Philadelphia, Pa. See Advertisers' Index.

MACHINES, Bolt Threading

Landis Machine Co., Inc., Waynesboro, Pa.

MACHINES, Drilling

Ingersoll Milling Machine Co., Rockford, Ill.

MACHINES, Drum Washing

WEIMAR ENGINEERING WORKS, Westmoreland & Jasper Sts., Philadelphia, Pa.

MACHINES, Milling

Brazelton, Wessendorff & Nelms, Houston, Texas.
Ingersoll Milling Machine Co., Rockford, Ill.
Reed-Prentice Co., Worcester, Mass.
E. J. Rooksby & Co., 1097 Hamilton St., Philadelphia, Pa.
John Steptoe Co., 2960 Colerain Ave, Cincinnati, Ohio

MACHINES, Pipe

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

MACHINES, Pipe Bending

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
R. S. Newbold & Son Co., Norristown, Pa.

MACHINES, Pipe and Nipple Threading

Landis Machine Co., Inc., Waynesboro, Pa.

MACHINES, Pipe Threading and Cutting

The Aetna-Standard Engineering Co., Ellwood City, Pa.
Bignall & Keller Machine Works, Edwardsville, Ill.
Landis Machine Co., Inc., Waynesboro, Pa.
Merrell Mfg. Co., 873 Curtis St., Toledo, Ohio.
Standard Engineering Co., Ellwood City, Pa.

MACHINES, Valve Reseating

THE LAGONDA MFG. CO., Springfield, Ohio. See Advertisers' Index.

Levitt Machine Co., Orange, Mass.

MACHINERY, Can Closing

Max-Ams Machine Co., 101 Park Ave., New York, N. Y.

MACHINERY, Can Making

E. W. Bliss Co., Brooklyn, N. Y.
Max-Ams Machine Co., 101 Park Ave., New York, N. Y.

MACHINERY, Elevating and Conveying

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

MACHINERY, Special

A. & F. Brown Co., 79 Barclay St., New York, N. Y.
P. H. Gill & Sons Forge & Machine Works, 2 Lorraine St., Brooklyn, N. Y.

MACHINERY, Steel Drum and Barrel

E. W. Bliss Co., Brooklyn, N. Y.
Max-Ams Machine Co., 101 Park Ave., New York, N. Y.

MAGNETS, Lifting

ELECTRIC CONTROLLER & MFG. CO., 2700 E. Seventy-Ninth St., Cleveland, Ohio. See Advertisers' Index.

MAGNETOS, Blasting

Davis Instrument Mfg. Co., 110 W. Fayette St., Baltimore, Md.

MANHEADS, Roof

OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index.

MAN-HOLES

Glasgow Iron Co., Pottstown, Pa.

MANIFOLDS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
City, Pa.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beave Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kan. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
Driver-Harris Co., Harrison, N. J.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Hershey Machine & Foundry Co., Manheim, Pa.
McEwen Bros., Wellsville, N. Y.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Reading Steel Castings Co., Reading, Pa.
Joseph Reid Gas Engine Co., Oil City, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond Va.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

MANIFOLDS, Oxygen

Air Reduction Sales Corp., 342 Madison Ave., New York, N. Y

MANIFOLDS, Oxygen and Acetylene

MODERN ENGINEERING CO., 3411-13 Pine Blvd., St. Louis Mo. See Advertisers' Index.

MANIFOLDS, Welding

Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.

MANOMETERS

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio. See Advertisers' Index.
LEE B. METTLER CO., 406 S. Main St., Los Angeles, Cal. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index
WILLIAMS, BROWN & EARLE, 918 hestnut St., Philadelphia, Pa. See Advertisers' Index.

The American Blower Co., 6004 Russell, Detroit, Mich.
Ashcroft Manufacturing Co., New York, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 720 Pine St., St. Louis, Mo.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
Taylor Instrument Co., Rochester, N. Y.

MASKS, Babbitting

PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, New York. See Advertisers' Index.

MASKS, Gas

MINE SAFETY APPLIANCES CO., 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.
PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Carbondale Machine Co., Carbondale, Pa.
Improved Aluminum Gaso Protector Co., 7216 Ridge Blvd., Chicago, Ill.

MASKS, Hose

MINE SAFETY APPLIANCES CO., 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.
PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

Improved Aluminum Gaso Protector Co., 7216 Ridge Blvd., Chicago, Ill.

MASKS, Paint Spraying

PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

METAL, Ignition

Ellsworth Haning, 114-18 Liberty St., New York, N. Y.

METAL, Sheet

American Brass Co., Waterbury, Conn.

METAL, Welding

Plouff Co., 170 Summer St., Boston, Mass.

METAL WORK, General Sheet

E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.

METERS, Air

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.

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When Tanks are Oceco Equipped, they are safe. Fire has never gone through an Oceco Flame Arrestor. This Flame Arrestor also eliminates continual replacing of clogged and corroded screens. Over 1500 Oceco Flame Arrestors are in use; some in every continent on the globe.

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Neilan, Schumacher & Co., Los Angeles, Cal.
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Cable Sheave Bracket

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THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.

Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Chas. J. Clark Blast Meter Co., Gladbrook, Iowa.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
The P. H. & F. M. Roots Co., Connersville, Ind.
Tirrill Gas Machine Lighting Co., 50 Church St., New York, N. Y.

METERS, Boiler

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.

METERS, Combustion

Jos. W. Hays Corp., 1042 E. 8th St., Michigan City, Ind.

METERS, Condensation

American District Steam Co., N. Tonawanda, N. Y.

METERS, Differential Flow

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.

Defender Automatic Regulator Co., 308 S. 8th St., St. Louis, Mo.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Chas. J. Clark Blast Meter Co., Gladbrook, Iowa.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.

METERS, Electrical

Cutler-Hammer Mfg. Co., Milwaukee, Wis.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
Jewell Electrical Instrument Co., 1650 Walnut St., Chicago, Ill.
Langstadt-Meyer Co., Appleton, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

METERS, Flow

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
NATIONAL METER CO., 299 Broadway, New York, N. Y. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

American Liquid Meter Co., 2217 Orange St., Alhambra, Calif.
Buffalo Meter Co., 2917 Main St., Buffalo, N. Y.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
General Electric Co., Schenectady, New York
Horton Machine Works, 4th & Magee Sts., Elmira, N. Y.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Keuffel & Esser Co., Hoboken, N. J.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Republic Flood Meter Co., 2236 Dwersey Parkway, Chicago, Ill.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.

METERS, Gas

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WESTCOTT & GREIS, INC., Tulsa, Okla. See Advertisers' Index.

Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Chas. J. Clark Blast Meter Co., Gladbrook, Iowa.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
The P. H. & F. M. Roots Co., Connersville, Ind.
Western Gas Construction Co., Fort Wayne, Ind.

METERS, Gasoline

METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
NATIONAL METER CO., 299 Broadway, New York, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Liquid Meter Co., 2217 Orange St., Alhambra, Calif.
Buffalo Meter Co., 2917 Main St., Buffalo, N. Y.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
National Supply Co., Toledo, Ohio
Neptune Meter Co., 50 E. 42nd St., New York City, N. Y.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Union Water Meter Co., Worcester, Mass.

METERS, Oil

BROWN INSTRUMENT CO., 4357 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 8 8½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL METER CO., 299 Broadway, New York, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Liquid Meter Co., 2217 Orange St., Alhambra, Calif.
Anthony Company, 138 West Ave., Long Island City, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Buffalo Meter Co., 2917 Main St., Buffalo, N. Y.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Hofmann Engineering Co., 557-9 W. Quincy St., Chicago, Ill.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Neptune Meter Co., 50 E. 42nd St. New York City, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rogers-Higgins Co., Inc., Canal Commercial Bldg., New Orleans, La.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Union Water Meter Co., Worcester, Mass.
Western Gas Construction Co., Fort Wayne, Ind.

METERS, Pipe Line

NATIONAL METER CO., 299 Broadway, New York, N. Y. See Advertisers' Index.

METERS, Water

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL METER CO., 299 Broadway, New York, N. Y. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American District Steam Co., North Tonawanda, N. Y.
American Liquid Meter Co., 2217 Orange St., Alhambra, Calif.
Buffalo Meter Co., 2917 Main St., Buffalo, N. Y.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Neptune Meter Co., 50 E. 42nd St., New York City, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
A. P. Smith Mfg. Co., East Orange, N. J.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Union Water Meter Co., Worcester, Mass.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Wilcox Engineering Co., 900 South Warren Ave., Saginaw, Mich.

METERS, Steam and Water

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

American District Steam Co., North Tonawanda, N. Y.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Neptune Meter Co., 50 E. 42nd St., New York City, N. Y.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.

METERS, Wide-Range

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.

Neptune Meter Co., 50 E. 42nd St., New York City, N. Y.

MICROSCOPES

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Palo Company, 153 W. 23rd St., New York, N. Y.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.

MILLS, Boring and Runging, Vertical

H. Bickford & Co., Lakeport, N.H.

MILLS, Colloid and Emulsion
Premier Mill Corporation, Geneva New York.

MILLS, Pebble Paint Grinding
Beach-Russ Co., 30 Church St., New York, N. Y.

MILLBOARD, Asbestos
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
National Supply Co., Toledo, Ohio
Norristown Mangesia & Asbestos Co., Norristown, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Philip Carey Co., Cincinnati, Ohio
Rogers Asbestos Co., Houston, Texas.

MINERAL WOOL
Norristown Mangesia & Asbestos Co., Norristown, Pa.

MIXERS
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.

MOTORS, Alternating Current
Roth Brothers & Co., 1400 W. Adams St., Chicago, Ill.

MOTORS, Direct Current
Rochester Electric Products Corp., 640 Driving Park Ave., Rochester, N. Y.
Roth Bros. & Co., 1400 W. Adams St., Chicago, Ill
B. A. Wesche Electric Co., 1628 Vine St., Cincinnati, Ohio.

MOTORS, Generator Sets
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.

MOTORS, Hydraulic
American Fluid Motors Co., 2412-14 Aramingo Ave., Philadelphia, Pa.

MOTORS, Induction
Louis Allis Co., 133 Stewart St., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Burke Electric Co., Erie, Pa.
Century Electric Co., 1806 Pine St., St. Louis Mo.
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
Emerson Electric Mfg. Co., 2012-32 Washington Ave., St. Louis, Mo.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
J. A. & Egan Fay Co., Front and John Sts., Cincinnati, Ohio.
Fidelity Electric Co., 331 No. Arch St., Lancaster, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Armature Works, Houston, Texas
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Langstadt-Meyer Co., Appleton, Wis.
The Linzee Electric Motor Co., Mansfield, Ohio.
Maintenance Co., Inc., 449-53 W. Forty-Second St., N. Y., N. Y.
Master Electric Company, First & Sears Sts., Dayton, Ohio.
National Supply Co., Toledo, Ohio
The Peerless Electric Company, Warren, Ohio.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Roth Bros. & Co., 1400 W. Adams St., Chicago, Ill
Southern Engine & Pump Co., Houston, Texas
Triumph Electric Co., Cincinnati, Ohio
B. A. Wesche Electric Co., 1628 Vine St., Cincinnati, Ohio.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

MOTORS, Polishing
Roth Bros. & Co., 1400 W. Adams St., Chicago, Ill

MOTORS, Single Phase
Brazelton, Wessendorff & Nelms, Houston, Texas.
Century Electric Co., 1806 Pine St., St. Louis Mo.
Continental Supply Co., St. Louis, Missouri
Emerson Electric Mfg. Co., 2012-32 Washington Ave., St. Louis, Mo.
Fairbanks-Morse & Co. 900 S. Wabash Ave., Chicago, Ill.
J. A. & Egan Fay Co., Front and John Sts., Cincinnati, Ohio.
Fidelity Electric Co., 331 No. Arch St., Lancaster, Pa.
F. W. Gartner Co., Houston, Texas.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Armature Works, Houston, Texas
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Langstadt-Meyer Co., Appleton, Wis.
Maintenance Co., Inc., 449-53 W. Forty-Second St., N. Y., N. Y
Master Electric Company, First & Sears Sts., Dayton, Ohio.
The Peerless Electric Company, Warren, Ohio.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Southern Engine & Pump Co. Houston, Texas
B. A. Wesche Electric Co., 1628 Vine St., Cincinnati, Ohio.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

MOTORS, Split Phase
Brazelton, Wessendorff & Nelms, Houston, Texas.
Century Electric Co., 1806 Pine St., St. Louis Mo.
Continental Supply Co., St. Louis, Missouri
Emerson Electric Mfg. Co., 2012-32 Washington Ave., St. Louis, Mo.
J. A. & Egan Fay Co., Front and John Sts., Cincinnati, Ohio.
Fidelity Electric Co., 331 No. Arch St., Lancaster, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Armature Works, Houston, Texas
Langstadt-Meyer Co., Appleton, Wis.
Maintenance Co., Inc., 449-53 W. Forty-Second St., N. Y., N. Y
National Supply Co., Toledo, Ohio
The Peerless Electric Company Warren, Ohio.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Southern Engine & Pump Co. Houston, Texas
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

MOTORS, Synchronous
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Burke Electric Co., Erie, Pa.
Crocker-Wheeler Electric Mfg. Co. Ampere, N. J.
Electric Machinery Mfg. Co., 14th & Tyler Sts., N. E. Minneapolis, Minn.
Emerson Electric Mfg. Co., 2012-32 Washington Ave., St. Louis, Mo.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
J. A. & Egan Fay Co., Front and John Sts., Cincinnati, Ohio.
Fidelity Electric Co., 331 No. Arch St., Lancaster, Pa.
Houston Armature Works, Houston, Texas
Langstadt-Meyer Co., Appleton, Wis.
Maintenance Co., Inc., 449-53 W. Forty-Second St., N. Y., N. Y.
National Supply Co., Toledo, Ohio
The Peerless Electric Company, Warren, Ohio.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Ridgway, Dynamo & Engine Co., Ridgway, Pa.
Southern Engine & Pump Co., Houston, Texas
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

N

NOZZLES, Rubber Spray
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.

NOZZLES, Spray
GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE COOLING TOWER CO., INC., 15 John Street, New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
POWER PLANT EQUIPMENT CO., 1004 Coca Cola Bldg., Kansas City, Mo. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Bayley Mfg. Co., 73 Greenbush St., Milwaukee, Wis.
Binks Spray Equipment Co., 3114 Carroll Ave., Chicago, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
MacLeod Company, Cincinnati, Ohio
Malleable Iron Fittings Co., Banford, Conn.
Monarch Mfg. Works, Emery & S. Westmoreland Sts., Philadelphia, Pa.
National Supply Co., Toledo, Ohio
Oliver Continuous Filter Co., San Francisco, Calif.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas

NOZZLES, Tank Shell
OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index

OIL CUPS, Brass
THE D. T. WILLIAMS VALVE CO., Cincinnati, Ohio. See Advertisers' Index.

OIL CUPS, Brass
THE D. T. WILLIAMS VALVE CO., Cincinnati, Ohio. See Advertisers' Index.

P

PACKING, Absorber
Dean E. Foster, New Wright Bldg., Tulsa, Okla.

PACKING, Ammonia
GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
METALASTIC, INC., 90 Montgomery St., Jersey City, N. J. See Advertisers' Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American Engineering Co., Philadelphia, Pa.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Arctic Ice Machine Co., Canton, Ohio
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Randolph Brandt, 66 Cortlandt St., New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Carbondale Machine Co., Carbondale, Pa.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Collins Metallic Packing Co., 56-58 No. Second St., Philadelphia, Pa.
Crandall Packing Co., Palmyra, New York
Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Frick Co., Inc., Waynesboro, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Thos. C. Warley & Co., 211-217 Bainbridge St., Philadelphia, Pa.
Witherup Cork Packing Co., Beaumont, Texas.
York Products Corporation, Houston, Texas.

PACKING, Asbestos
JOHNS-MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.

Keasbey & Mattison Co., Ambler, Pa.

PACKING, Sheet Asbestos
Rogers Asbestos Co., Houston, Texas

PACKING, Cork
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Felt

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Booth Felt Co., Inc., 463-473 Nineteenth St., Brooklyn, N. Y.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Rogers Asbestos Co., Houston, Texas.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Union Fibre Co., Winona, Minn.

PACKING, Fibrous

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Randolph Brandt, 66 Cortlandt St., New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Union Fibre Co., Winona, Minn.

PACKING, Flax

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

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Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Union Fibre Co., Winona, Minn.

PACKING, Gasoline

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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Randolph Brandt, 66 Cortlandt St., New York, N. Y.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
Diamond Rubber Co., Inc., Akron, Ohio.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
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La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co. 91-93 Chamber St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Gasoline Pump

Keasbey & Mattison Co., Ambler, Pa.

PACKING, High Pressure

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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Randolph Brandt, 56 Cortlandt St., New York, N. Y.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
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Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Hydraulic

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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The Burroughs Co., 246 N. Tenth St., Newark, N. J.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Richard Dudgeon, Inc., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Excelsior Valve Co., 106-108 Fulton St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.
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La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Mabbs Hydaulic Packing Co., 431 S. Dearborn St., Chicago, Ill.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Thos. C. Warley & Co., 211-217 Bainbridge St., Philadelphia, Pa.
Western Rawhide & Belting Co., 901-35 Winnebago St., Milwaukee, Wis.

PACKING, Leather

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
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Bay State Belting Co., 349 Congress St., Boston, Mass.
The Burroughs Co., 246 N. Tenth St., Newark, N. J.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Richard Dudgeon, Inc., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
The Graton & Knight Mfg. Co., 356 Franklin St., Worcester, Mass.
E. F. Houghton & Co., Philadelphia, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.
Mabbs Hydaulic Packing Co., 431 S. Dearborn St., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
The N. Palmer Belting Co., Bridgeport, Conn.
Philadelphia Belting Co., Sixth & Spring Garden Sts., Philadelphia, Pa.
Chas. A. Schieren Co., 77 Ferry St. New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas
Union Belt Co., 66 Troy St., Fall River, Mass.
Warren Belting Co., 33 Artic St., Worcester, Mass.

PACKING, Metallic

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
CRANE PACKING CO., 1800 Cuyler Ave., Chicago, Ill. See Advertisers' Index.
GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.

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Plouff Co., 170 Summer St., Boston, Mass.
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Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

PACKING, Oil

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
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Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Oil Pump

U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

PACKING, Paper

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

PACKING, Piston

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
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Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Pump Rings

Keasbey & Mattison Co., Ambler, Pa.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.

PACKING, Rawhide

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
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Charles Bond Co., 617-619 Arch St., Philadelphia, Pa.
Chicago Belting Co., 125 N. Green, Chicago, Ill.
Chicago Rawhide Mfg. Co., 1273 Elston Ave., Chicago, Ill.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Supply Co., St. Louis, Missouri.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
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F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Mabbs Hydaulic Packing Co., 431 S. Dearborn St., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Western Rawhide & Belting Co., 901-35 Winnebago St., Milwaukee, Wis.

PACKING, Rope and Wick

Philip Carey Co., Cincinnati, Ohio

PACKING, Rubber

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
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Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
Diamond Rubber Co., Inc., Akron, Ohio.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
B. F. Goodrich Rubber Co., Akron, Ohio
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Petroleum Supply Co., Houston, Texas
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Republic Rubber Co., Youngstown, Ohio
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Voorhees Rubber Mfg. Co., 20 Bostwick Ave., Jersey City, N.J.

PACKING, Sheet

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.
METALLO GASKET CO., New Brunswick, N. J. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
R. V. Aycock Co., Kansas City, Mo.
Black, Sivalls & Bryson, Bartlesville, Okla.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Randolph Brandt, 66 Cortlandt St., New York, N. Y.
Cancos Mfg. Co., Bridge & Garden Sts., Bridesburg, Philadelphia, Pa.
Cincinnati Gasket & Packing Co., 1546-48 Elm St., Cincinnati, Ohio
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
B. F. Goodrich Rubber Co., Akron, Ohio
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Imperial Belting Co., Lincoln & Kenzie Sts., Chicago, Ill.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Oil Well Supply Co., Pittsburgh, Pa.
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Republic Rubber Co., Youngstown, Ohio
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Texas Belting Co., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Thos. C. Warley & Co., 211-217 Bainbridge St., Philadelphia, Pa.
Witherup Cork Packing Co., Beaumont, Texas.

PACKING, Valve

Keasbey & Mattison Co., Ambler, Pa.

PACKING, Asbestos Braided Valve

Keasbey & Mattison Co., Ambler, Pa.

PACKING, Asbestos Split Rings Valve
Keasbey & Mattison Co., Ambler, Pa.

PACKING, Asbestos Twisted Valve
Keasbey & Mattison Co., Ambler, Pa.

PACKING, Valve Steam
GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.

PAINTS, Acidproofing
Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.

PAINTS, Acid Resisting
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Cal. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Products Co., Euclid, Ohio
The Dampney Co. of America, 50-60 Business St., Boston, Mass.
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Preservative Paint Co., Seattle Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond Va.
Rogers Asbestos Co., Houston, Texas.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Silumite Products Corp., 1410 Morris Bldg., Philadelphia, Penna.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.
Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.

PAINTS, Aluminum
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

Continental Products Co., Euclid, Ohio
Lowe Bros. Co., Dayton, Ohio.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.

PAINTS, Black Hot Surface
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.

PAINTS, Boiler Wall
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

PAINTS, Concrete
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston. Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Cal. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY. 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 1112 W 37th St., Chicago, Illinois
Preservative Paint Co., Seattle, Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Silumite Products Corp., 1410 Morris Bldg., Philadelphia, Penna.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo
Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Concrete Waterproofing
Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Dampproofing
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.

DRUM PAINTS
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Calif. See Advertisers' Index.

PAINTS, Enamel
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Cal. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Kuhn Paint & Varnish Works, Houston, Texas.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Preservative Paint Co., Seattle, Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.
Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.
Vane-Calvert Paint Co., St. Louis, Mo.

PAINTS, Galvanized Iron
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

PAINTS, Graphite
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Cal. See Advertisers' Index.
WARD CHEMICAL COMPANY. 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Continental Products Co., Euclid, Ohio
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., New Orleans, La.
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
Oil Well Supply Co., Pittsburgh, Pa.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Preservative Paint Co., Seattle, Wash.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.
United States Graphite Co., Saginaw, Mich.

PAINTS, High Temperature
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

PAINTS, Machinery
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.

PAINTS, Oilproofing
Truscon Laboratories, Carriff & G. T. R.R., Detroit, Mich.

PAINTS, Pipe Line
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Calif. See Advertisers' Index.

The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.

PAINT POWDER
AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.

Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.

PAINTS, Pump
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index .
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Cal. See Advertisers' Index.

QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Beach-Russ Co., 30 Church St. New York, N. Y.
Continental Products Co., Euclid Ohio
Continental Supply Co., St. Louis Missouri
E. I. DuPont de Nemours & Co 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
John F. Nolan Co., 3100 Butler St., Houston, Texas.
Paraffine Cos. Inc., San Francisco Calif.
Preservative Paint Co., Seattle. Wash.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo
Thomas Pump Works, 154 Spring St., New York, N. Y.

PAINTS, Red Lead

AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Carter White Lead Co., 12042 Peoria St., Chicago, Ill.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa
Marine Paint & Varnish Co., Inc., New Orleans, La.
National Lead Co., 111 Broadway. New York City.
Paraffine Cos. Inc., San Francisco Calif.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Preservative Paint Co., Seattle, Wash.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.

PAINTS, Roofing

COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.

The Eclipse Paint & Mfg. Co. Cleveland, Ohio.

PAINTS, Steel

Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Steel Preservative

AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO. North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bk. Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
The Dampney Co. of America, 50 60 Business St., Boston, Mass.
E. I. DuPont de Nemours & Co. 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co. Cleveland, Ohio.
Springfield, Mass.
Hampton Paint & Chemical Co.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn. N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans Water and Norton Sts., Buffalo. New York.
John F. Nolan Co., 3100 Butler St., Houston, Texas.
Paraffine Cos. Inc., San Francisco Calif.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Philip Carey Co., Cincinnati, Ohio
Preservative Paint Co., Seattle, Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Silumite Products Corp., 1410 Morris Bldg., Philadelphia, Penna.
St. Louis Surfacer & Paint Co 5506 Hazel Ave., St. Louis, Mo
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo
Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Tank

AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1506 Second Nat. Bank Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Calif See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harison Ave., S. W. Canton, Ohio.
Black, Sivalls & Bryson, Bartlesville, Okla.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Kuhn Paint & Varnish Works, Houston, Texas.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
John F. Nolan Co., 3100 Butler St., Houston, Texas.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Preservative Paint Co., Seattle, Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Silumite Products Corp., 1410 Morris Bldg., Philadelphia, Penna.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.
Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Tank Car

American Paint & Supply Co., Dallas, Texas
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1500 Second Nat. Bank Bldg., Houston, Texas. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Calif. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton. Ohio
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
E. I. DuPont de Nemours & Co., 2100 Elston Ave., Chicago, Ill.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keystone Varnish Co., Brooklyn, N. Y.
Lowe Bros. Co., Dayton, Ohio.
John Lucas Co., Philadelphia, Pa
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
John F. Nolan Co., 3100 Butler St., Houston, Texas.
Paraffine Cos. Inc., San Francisco, Calif.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Preservative Paint Co., Seattle, Wash.
Pro-Tar Products Co., 305 Delaware St., Kansas City, Mo.
Sewall Paint & Varnish Co., 1009 W. Eighth St., Kansas City, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Silumite Products Corp., 1410 Morris Bldg., Philadelphia, Penna.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo
Tnemec Paint & Oil Co., 3122 Roanoke Road, Kansas City, Mo.
Truscon Laboratories, Carriff & G T. R.R., Detroit, Mich.

PAINTS, Tank Car Interior

The Eclipse Paint & Mfg. Co., Cleveland, Ohio.

PAINTS, Tank Headlining

DETROIT GRAPHITE CO. OF TEXAS, 1500 Second Nat. Bank Bldg., Houston, Texas. See Advertisers' Index.

PAINTS, Weatherproofing

DETROIT GRAPHITE CO. OF TEXAS, 1500 Second Nat. Bank Bldg., Houston, Texas. See Advertisers' Index.

PAINTS, White Lead

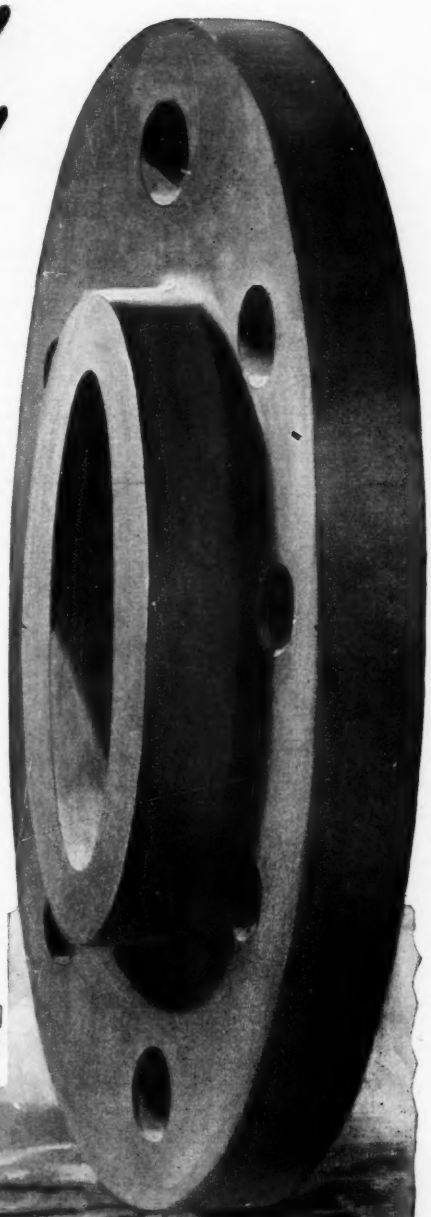
AMERICAN PAINT & SUPPLY CO., Dallas, Texas, See Advertisers' Index.
COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.
DETROIT GRAPHITE CO. OF TEXAS, 1500 Second Nat. Bank Houston, Texas. See Advertisers' Index.

Acmo Color & White Lead Co., 8250 St. Aubin, Detroit, Mich.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio
Carter White Lead Co., 12042 Peoria St., Chicago, Ill.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
Heath & Milligan Mfg. Co., 1833 Seward, Chicago, Ill.
International Compositions Co., 25 Broadway, New York City, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
John Lucas Co., Philadelphia, Pa.
Marine Paint & Varnish Co., Inc., New Orleans, La.
McDougall-Butler Co., Inc., Evans, Water and Norton Sts., Buffalo, New York.
National Lead Co., 111 Broadway, New York City.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
St. Louis Surfacer & Paint Co., 5506 Hazel Ave., St. Louis, Mo.

PANS, Dephlegmator

CRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

No better Flanges! No better Service!



Indestructibility! Quick availability!

These are the two big reasons for the steadily increasing use of Penn Forge Flanges. More and more industrial engineers are coming to know that "Penn Forge" means dependable flanges delivered ON TIME!

Penn Forge Flanges cost less in the long run. They insure perfectly sealed joints—and they withstand every shock and strain of high pressure, expansion and contraction, fluctuating temperatures, water hammer, accidental blows—everything.

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Selected open hearth steel, with a tensile strength of 60,000 lbs., elastic limit 30,000 lbs.—or if corrosion is a problem, Stainless Steel, Monel Metal, nickel, copper—any alloy.

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No better flanges! No better service!

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Stocks carried at most branches

San Francisco: Chas. I. James, 525 Market Street
Los Angeles, Cal.: John G. Bell Co., 923 Sante Fe Ave.
St. Louis, Mo.: W. R. Maxwell, 915 Olive St.
Phila., Pa.: Ford & Kendig Co., 1428 Callowhill St.
Boston, Mass.: E. B. Badger & Son Co., 75 Pitts St.
Tulsa, Okla.: A. J. McEwan, 1704 S. Utica St.

The strength of the line is only the strength of the Flanges

Penn Forge Flanges

WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Carbondale Machine Co., Carbondale, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Erie City Iron Works, Erie, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

PANS, Sweating

GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Carbondale Machine Co., Carbondale, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Erie City Iron Works, Erie, Pa.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.

PANELS, Enclosure

Lyon Metallic Mfg. Co., Aurora, Ill.

PAPER, Asbestos

Philip Carey Co., Cincinnati, Ohio

PAPER, Blue Print

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
Paragon Machine Co., 77 South Rochester, N. Y.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
Spaulding-Moss Co., 42 Franklin St., Boston, Mass.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

PAPER, Drawing and Tracing

Spaulding-Moss Co., 42 Franklin St., Boston, Mass.

PAPER, Filter

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Griebel Instrument Co., Carbondale, Pa.
C. B. Hewitt & Brothers, New York, N. Y.
Palo Company, 153 W. 23rd St., New York, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.

PARTITIONS, Panel

Columbia Fence & Wire Co., Dallas, Texas

PASTE

Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.

PENCILS, Drawing and Colored Leads

Spaulding-Moss Co., 42 Franklin St., Boston, Mass.

PETROLEUM TESTING APPARATUS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

PICKS

Continental Supply Co., St. Louis, Missouri
R. B. Everett Co., Houston, Texas
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.

PINS, Piston

The Dyer Mfg. Co., 155 Brookline St., Cambridge, Mass.

PIPE, Aluminum

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.

Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.

PIPE, Cast Iron

AMERICAN CAST IRON PIPE CO., Birmingsam, Alabama.
AMERICAN RADIATOR CO., 816-820 S. Michigan Ave., Chicago, Ill. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Boyts, Porter & Co., Connellsville, Pa.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
F. Ferguson & Son, Clinton, Grand & Twelfth Sts., Hoboken, N. J.
Grinnell Co., Inc., Providence, R.I.
Hartwell Iron Works, Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Independent Foundry Co., 73 York St., Portland, Ore.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Cast Iron Pipe Co., Birmingham, Ala.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

PIPE, Culvert

Penn Metal Co., 675 Concord Ave., Cambridge, Mass.

PIPE, Galvanized Culvert

United Alloy Steel Corp., Canton, Ohio.

PIPE, Riveted, Bolted Culvert

United Alloy Steel Corp., Canton, Ohio.

PIPE, Fabricated

MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Arctic Ice Machine Co., Canton, Ohio
Ballwood Co., 30 Church St., New York, N. Y.
Chicago Steel Car Co., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Grinnell Co., Inc., Providence, R.I.
Jas. G. Heggie & Sons, Joliet, Ill.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles. Calif.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
W. K. Mitchell & Co., Inc., Ellsworth St. & Schuylkill River. Philadelphia, Pa.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Boiler Washing Co., Railway Exchange, Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Richmond Engineering Co. 935. Brook Ave., Box 514, Richmond, Va.
Roessing Mfg. Company, Sharpsburg Station, Pittsburgh, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St. Toledo, Ohio
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Thorn, J. S. Co., 12th and Allegheny Ave., Philadelphia, Pa.
Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

PIPE, Gas

POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Central Tube Co., 1st Nat. Bk. Bldg., Pittsburgh, Pa.
Jas. G. Heggie & Sons, Joliet, Ill.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Boiler Washing Co., Railway Exchange, Chicago, Ill.
National Cast Iron Pipe Co., Birmingham, Ala.
National Supply Co., Toledo, Ohio
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
South Chester Tube Co., Chester, Pa.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Western Gas Construction Co., Fort Wayne, Ind.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

PIPES, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

PIPE, Riveted

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Hartwell Iron Works, Houston, Texas
Jas. G. Heggie & Sons, Joliet, Ill.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
International Engineering Works, Inc., Framingham, Mass.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
New York Engineering Co., 2 Rector St., New York, N. Y.
R. S. Newbold & Son Co., Norristown, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Wm. Scaife & Sons Co., Oakmont, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Thorn, J. S. Co., 12th and Allegheny Ave., Philadelphia, Pa.
Treadwell Construction Co., Midland, Pa.

Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

PIPE, Seamless Brass

MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

American Brass Co., Waterbury, Conn.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Chase Metal Works, Waterbury, Conn.
Cox Brass Mfg Co., Albany, N. Y.
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Southern Brass Mfg. Co., Houston, Texas.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.

PIPE, Seamless Steel

BABCOCK & WILCOX CO., 85 Liberty Ave., Long Island City, N. Y.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
PITTSBURGH STEEL PRODUCTS CO., Union Arcade Bldg., Pittsburgh, Pa. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
Globe Steel Tubes Co., 1345 Burnham St., Milwaukee, Wis.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Pittsburgh Steel Products Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Standard Seamless Tube Co., 313 Sixth Ave., Pittsburgh, Pa.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

PIPE, Steam Jacketed

The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.

PIPE, White Iron

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.

PIPE, Wrought Iron

A. M. Byers Company, 235 Water, Pittsburgh, Pa.
Reading Iron Co., Reading, Pa.

PIPE BENDS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Albright's Son & Co., Allentown, Pa.
American Tube & Pipe Bending Co., Niles, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Ballwood Co., 30 Church St., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Carbondale Machine Co., Carbondale, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Continental Supply Co., St. Louis, Missouri
De Soto Foundry & Machinery Co., Mansfield, La.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Car Wheel & Machine Co., Houston, Texas.
W. K. Mitchell & Co., Inc., Ellsworth St. & Schuylkill River, Philadelphia, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Joseph Oat & Sons, 232 Quarry St., Philadelphia, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Richmond Engineering Co. 935 Brook Ave., Box 514, Richmond, Va.
Roessing Mfg. Company, Sharpsburg Station, Pittsburgh, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Vulcan Steam Forging Co., 247 Rano St., Buffalo, N. Y.
Warren Foundry & Machine Co., 11 Broadway, New York, N. Y.
Whitlock Coil Pipe Co., Hartford, Conn.

PIPE BENDS, Lead Lined

United Lead Co., 11 Brooklyn, New York, N. Y.

PIPE COVERING MATERIALS

BANNER ROCK PRODUCTS CO., Alexandria, Ind. See Advertisers' Index.
HILL, HUBBELL & CO., 115 Davis St., San Francisco, Calif. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Acme Asbestos Covering & Supply Co., 242 N. Elizabeth St., Chicago, Ill.
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Central Asbestos & Magnesia Co., 214-216 W. Grand Ave., Chicago, Ill.
Dearborn Chemical Co., 323 S. Michigan Ave., Chicago, Ill.
W. S. Dickey Clay Mfg. Co., Texarkana, Texas
Ehret Magnesia Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Ehrot Magnesia Mfg. Co., Valley Forge, Pa.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philip Carey Co., Cincinnati, Ohio
Rogers Asbestos Co., Houston, Texas.
Standard Asbestos Mfg. Co., 820-22 West Lake St., Chicago, Ill.
Union Fibre Co., Winona, Minn.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

PIPING, High Pressure Steam

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

PIPING, Installation

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

PIPING, Power

MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass.

American District Steam Co., North Tonawanda, N. Y.
Grinnell Co., Inc., Providence, R.I.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
W. K. Mitchell & Co., Inc., Ellsworth St. & Schuylkill River, Philadelphia, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Boiler Washing Co., Railway Exchange, Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Roessing Mfg. Company, Sharpburg Station, Pittsburgh, Pa.
Shaw-Kendall Engineering Company, 120-130 S. Superior St., Toledo, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
South Chester Tube Co., Chester, Pa.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Urbauer-Atwood Co., 1450 S. 2nd St., St. Louis, Mo.

PIPING, Water

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

PISTONS

The Dyer Mfg. Co., 155 Brookline St., Cambridge, Mass.

PLANERS, Metal Working

National Supply Co., Toledo, Ohio
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Reed-Prentice Co., Worcester, Mass.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.

PLANIMETERS

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Schaeffer & Budenberg Corp., Berry & S. Fifth St., Brooklyn, N. Y.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Trill Indicator Co., Center St., Corry, Pa.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Il.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

PLANTS, Complete, Natural Gasoline

GASOLINE RECOVERY CO., Peoples Bank Bldg., Charleston, W. Va. See Advertisers' Index.

Dean E. Foster, New Wright Bldg., Tulsa, Okla.

PLANTS, Contact Filter

Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

PLANTS, Continuous Treating

Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

PLANTS, Gasoline Absorption

The Adsole Co. of America, 201 Los Angeles City Club Bldg., Los Angeles, Cal.

PLANTS, Wax

Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

PLATES, Netting

Erie City Iron Works, Erie, Pa.
Hendrick Mfg. Co., Carbondale, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

PLATES, Screw

Greenfield Tap & Die Corp'n., Greenfield, Mass.

PLATES, Steel

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kans. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Allegheny Steel Co., Pittsburgh, Pa.
American Iron Works, Inc., Louisville, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.

Chicago Steel Car Co., Chicago, Ill.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
The Cullen Co., Clinton, Iowa
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hartwell Iron Works, Houston, Texas
Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
Inland Steel Co., 38 South Dearborn St., Chicago, Ill.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Luken Steel Co., C. E. Naylor, Houston, Texas.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
The Stanwood Corp., Cincinnati, O.
Texas Carnegie Steel Assn., Galveston, Texas.
Worth Steel Co., Calymont, Delaware
The Youngstown Boiler & Tank Co., Youngstown, Ohio
The Youngstown Sheet & Tube Co., Youngstown, Ohio

PLUGS, Automatic Tar

OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

PLUGS, Bull

PENNSYLVANIA FORGE CO., Bridesburg, Philadelphia, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas

PLUGS, Flue

Plouff Co., 170 Summer St., Boston, Mass.

PLUGS, Fusible

THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
THE D. T. WILLIAMS VALVE CO., Cincinnati, Ohio. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Erie City Iron Works, Erie, Pa.
Grinnell Co., Inc., Providence, R.I.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Armature Works, Houston, Texas
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
National Supply Co., Toledo, Ohio
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston Texas
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Southern Brass Mfg. Co., Houston, Texas.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
U. S. Indestructible Gasket Co. 829 E. 15th St., Brooklyn, N. Y

PLUGS, Still

HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., Cleveland, O. See Advertisers' Index.
PENNSYLVANIA FORGE CO., Bridesburg. Philadelphia, Pa. See Advertisers' Index.
HENRY VOGT MACHINE CO Louisville, Ky. See Advertisers' Index.

The Alcumite Corporation, Dayton, Ohio.
National Supply Co., Toledo, Ohio
The Ohio Steel Foundry Co., Springfield, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Steel Improvement & Forge Co., Cleveland, Ohio.

PLUNGERS, Porcelain

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.

POLES, Gauge

FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.

Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Continental Supply Co., St. Louis, Missouri
Marsh Gauge Pole Co., Titusville Pa.
Oil Well Supply Co., Pittsburgh Pa.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia Pa.

POLYMERIZERS

TULSA BOILER & MACHINERY CO., P. O. Box 1963. Tulsa Okla. See Advertisers' Index.

PREHEATERS

BESSEMER GAS ENGINE CO Grove City, Pa. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra Cal. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal. See Advertisers' Index.
POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertising Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.

The Air Preheater Corp., 25 Broadway, New York, N. Y.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American Tank Co., Okla. City, Okla.
The Badenhausen Corp., 1011 Chestnut St., Philadelphia, Pa.
Bousman Mfg. Co., Inc., 1153-57 Plainfield Ave., N. E., Grand Rapids, Mich.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Dean E. Foster, New Wright Bldg., Tulsa. Okla.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
MacLeod Company, Cincinnati, Ohio
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Electric Heating Co., 10 High St., Boston, Mass.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Treadwell Construction Co., Midland, Pa.
Whitlock Coil Pipe Co., Hartford, Conn.

PREHEATING, Torches

NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
Carbic Mfg. Co., Duluth, Minn.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
MacLeod Company, Cincinnati, Ohio
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Oxygen Co., 5811 W. 66th St., Chicago, Ill.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Torchweld Equipment Co., 224 No Carpenter St., Chicago, Ill.

PRESSES, Wax

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

PROCESS, Lubricating Oil

Byron Jackson Pump Mfg. Co., Inc., 412 S. San Pedro St., Los Angeles, Calif.

PROCESS WORK

C. B. Roberts Engineering Co., 25 Broadway, New York, N. Y.

PROTECTOR APPARATUS

PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

Hall & Brown Wood Working Machine Co., Broadway, Tyler & Ninth Sts., St. Louis, Mo.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Torchweld Equipment Co., 224 No Carpenter St., Chicago, Ill.

PULLEYS

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.
Charles Bond Co., 617-619 Arch St., Philadelphia, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Continental Supply Co., St. Louis, Missouri
R. & J. Dick Co., Inc., Passiac, N. J.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Armature Works, Houston, Texas
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
W. T. Shackley & Son, 523 Atlantic Ave., Boston, Mass.
Southern Engine & Pump Co., Houston, Texas
The Stanwood Corp., Cincinnati, O.
Texas Belting Co., Houston, Texas.
Williamsport Wire Rope Co., Williamsport, Pa.
T. B. Wood's Sons Co., Chambersburg, Pa.

PULLEYS, Clutch

A. & F. Brown Co., 79 Barclay St., New York, N. Y.

PULVERIZERS

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
Moloch Co., Kaukauna, Wis.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

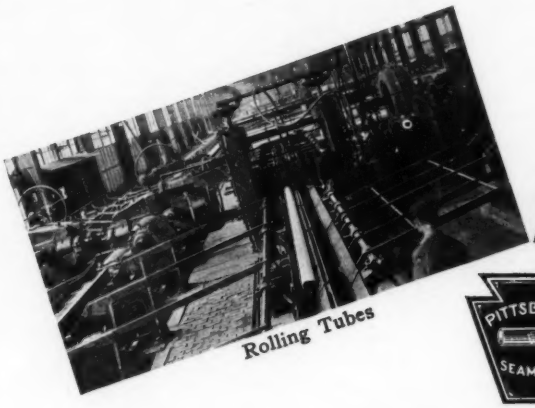
PUMPS, Acid

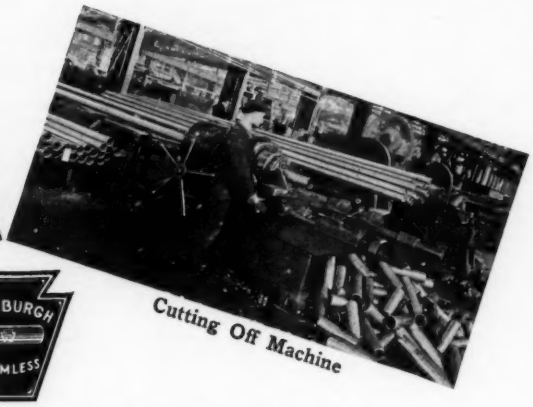
Oliver Continuous Filter Co., Oakland, Calif.

PUMPS, Air

BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., Buffalo, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago. Ill.
Allen & Billmyre Co., Inc., Grand Central Palace, New York City, N. Y.
American Steam Pump Co., Battle Creek, Mich.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Brunner Mfg. Co., Utica, N. Y.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Croll-Reynolds Eng'rg. Co., Inc., 95 Liberty St., New York, N. Y.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Houston Armature Works, Houston, Texas





PITTSBURGH SEAMLESS

Controlled Uniformity

We are able to maintain a remarkable uniformity in the chemical and physical properties of Pittsburgh Seamless Tubes because every step in manufacturing is conducted in our own furnaces and mills. This control over the quality of Pittsburgh Seamless Tubing insures unexcelled service and durability under the severe conditions of oil refining.

Pittsburgh Seamless Boiler Tubes and Still Tubing

are made by piercing solid billets of basic open hearth steel. They have high tensile strength and elastic limit, possess a high safety factor and are low in sulphur and phosphorus to resist pitting and corrosion. Our complete facilities assure you prompt service. Your inquiries will be appreciated.

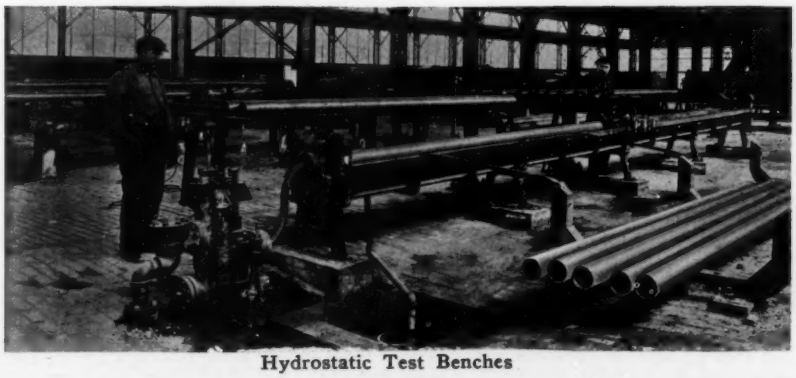
Pittsburgh Steel Products Co.

Pittsburgh, Pa.

NEW YORK DETROIT CHICAGO

Second National Bank Bldg. Houston, Texas

Atlas Life Bldg. Tulsa, Okla.



Hydrostatic Test Benches

Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Latta-Martin Pump Co., Hickory, N. C.
Leiman Bros., 23 Walker St., New York, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Lucas Pump & Tool Co., 427 Valley St., Dayton, Ohio
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
Mesta Machine Co., Pittsburgh, Pa.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
The P. H. & F. M. Roots Co., Connersville, Ind.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Trane Co., LaCrosse, Wis.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Wagener Steam Pump Co., Canton, Ohio.
Western Machinery Co., Los Angeles, Calif.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Air Rotary

Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Ammonia

GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
HILLS-McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American Steam Pump Co., Battle Creek, Mich.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Beach-Russ Co., 30 Church St., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Carbondale Machine Co., Carbondale, Pa.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frick Co., Inc., Waynesboro, Pa.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Byron Jackson Pump Mfg. Co., Inc., S. San Pedro St., Los Angeles, Calif.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
Geo. D. Roper Corp., Rockford, Ill.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Barrel

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.

PUMPS, Boiler Feed

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ont., Canada.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blakeslee Mfg. Co., Du Quoin, Ill.
Boyts, Porter & Co., Connellsville, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
Coppus Engineering Corp., 342-348 Park Ave., Worcester, Mass.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
M. W. Jamieson & Co., 1309 Fourth Ave., Warren, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kitts Mfg Co., Oswego, N. Y.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Le Courtenay Co., 4 Maine, Newark, N. J.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Lucas Pump & Tool Co., 427 Valley St., Dayton, Ohio
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
The Stanwood Corp., Cincinnati, O.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Trane Co., LaCrosse, Wis.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Cargo

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., SENECA Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City Pa. See Advertisers' Index.

American Steam Pump Co., Battle Creek, Mich.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburg, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Centrifugal

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
Cook Motor Co., Delaware, Ohio.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
Domestic Engine & Pump Co., Shippensburg, Pa.
Driver-Harris Co., Harrison, N. J.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Emerson Pump & Valve Co., Inc., Alexandria, Va.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
R. B. Everett Co., Houston, Texas
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
F. W. Gartner Co., Houston, Texas.
Heer Gas & Oil Engine Co., Portsmouth, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Houston Car Wheel & Machine Co., Houston, Texas.
Humphreys Mfg. Co., Mansfield, O.
Indiana Air Pump Co., 816 Indiana Pythian Bldg., Indianapolis, Indiana
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Byron Jackson Pump Mfg. Co., Inc., S. San Pedro St., Los Angeles, Calif.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
LeCortenay Company 5 Main St., Newark, N. J.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
Novo Engine Co., Lansing, Mich.
Oliver Continuous Filter Co., Oakland, Calif.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Swaby Mfg. Co., 2010 Marshall Blvd., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Tips Foundry & Machine Co., Austin, Texas
Trane Co., LaCrosse, Wis.

Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Engineering Co., Cleveland, Ohio.
Union Steam Pump Co., Battle Creek, Mich.
Universal Motor Co., 39 Ceape St., Oshkosh, Wis.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Wilson-Snyder Manufacturing Co., Pittsburg, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Hard Lead Centrifugal

United Lead Co., 111 Broadway, New York, N. Y.

PUMPS, Circulating

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn, N. Y.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Le Courtenay Co., 4 Maine, Newark, N. J.
Lobee Pump & Machinery Co., 119-129 Dearborn St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Maxon Premix Burner Co., Muncie, Ind.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Swaby Mfg. Co., 2010 Marshall Blvd., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Tips Foundry & Machine Co., Austin, Texas
Trane Co., LaCrosse, Wis.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Western Gas Construction Co., Fort Wayne, Ind.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Wilson-Snyder Manufacturing Co., Pittsburg, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Condensation

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Steam Pump Co., Battle Creek, Mich.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Frederick Iron & Steel Co., Frederick, Md.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Le Courteney Co., 4 Maine, Newark, N. J.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Trane Co., LaCrosse, Wis.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Worthintgon Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Duplex Steam

Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Worthintgon Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Force

GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
A. L. HENDERER'S SONS, Maryland Ave. & Beech St., Wilmington, Delaware. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Boyts, Porter & Co., Connellsville, Pa.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Continental Supply Co., St. Louis, Missouri
Cook Motor Co., Delaware, Ohio.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co. Salem, Ohio
Domestic Engine & Pump Co., Shippensburg, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
R. B. Everett Co., Houston, Texas
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Horton Machine Works, 34th and Magee Sts., Elmira, N. Y.
Humphreys Mfg. Co., Mansfield, O.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Novo Engine Co., Lansing, Mich.
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Geo. D. Roper Corp., Rockford, Ill.

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Fuel Oil

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca, N. Y. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Fluid Motors Co., 2412-14 Aramingo Ave., Philadelphia, Pa.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn, N. Y.
American Steam Pump Co., Battle Creek, Mich.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Coppus Engineering Corp., 342-348 Park Ave., Worcester, Mass.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
The Lima Pump & Supply Company, Lima, Ohio.
Lobee Pump & Machinery Co., 119-129 Dearborn St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Maxon Premix Burner Co., Muncie Ind.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.

Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Gear

SCHUTTE & KOERTING CO 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, N. Y.

PUMPS, High Pressure Still

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS ,INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 56 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
The P. H. & F. M. Roots Co., Connersville, Ind.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburg, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Hot Oil

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
Beach-Russ Co., 30 Church St., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Blake Pump Co., Fitchburg, Mass.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co. 85 W. Broad St., Columbus, O.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Coppus Engineering Corp., 342-348 Park Ave., Worcester, Mass.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co., Salem, Ohio.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Driver-Harris Co., Harrison, N. J.
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
The Lima Pump & Supply Company, Lima, Ohio.
Lobee Pump & Machinery Co. 119-129 Dearborn St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Wilson-Snyder Manufacturing Co., Pittsburg, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Hydraulic

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
A. L. HENDERER'S SONS Maryland Ave. & Beech St., Wilmington, Delaware. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Fluid Motors Co., 2412-14 Aramingo Ave., Philadelphia, Pa
American Steam Pump Co., Battle Creek, Mich.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blake Pump Co., Fitchburg, Mass
Boyts, Porter & Co., Connellsville Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
The Burroughs Co., 246 N. Tenth St., Newark, N. J.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis Ind.
Deming Co, Salem, Ohio
Richard Dudgeon, Inc., New York N. Y.
Fairbanks-Morse & Co., 900 S Wabash Ave., Chicago, Ill.
Guild & Garrison, 463 Kent Ave. Brooklyn, N. Y.
Gardner-Governor Co., Quincy, Ill
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt Gilead, Ohio.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans La.
May Machinery Co., Second National Bank Bldg., Houston, Tex
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
Oilgear Company, 60 62 27th St., Milwaukee, Wis.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
John Robertson & Co., Inc., 133 Water St., Brooklyn, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York. N. Y.

PUMPS, Lead Acid

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.

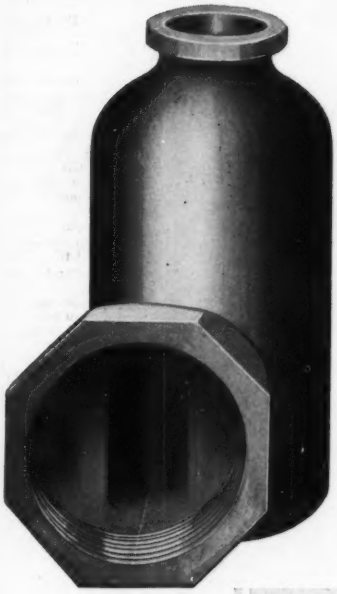
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
Boyts, Porter & Co., Connellsville, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago Ill.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
Moloch Co., Kaukauna, Wis.
Oliver Continuous Filter Co., San Francisco, Calif.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Weinman Pump Mfg. Co., Columbus, Ohio.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Oil

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn, N. Y.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St., New York, N. Y.
W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Blake Pump Co., Fitchburg, Mass.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Co., 85 W. Broad St., Columbus, Ohio.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.

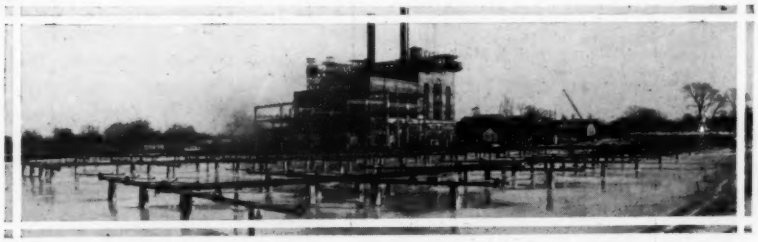
SPRAY COOLING EQUIPMENT



—LARGE STOCKS —FOR— QUICK SHIPMENT

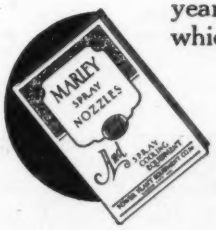
TO serve you promptly and quickly, Marley maintains large stocks of Spray Nozzles and Spray Cooling Equipment. Costs a pretty penny—but is just a part of **that** Marley service which is so highly satisfactory to spray cooling equipment purchasers everywhere.

Requisitions or inquiries for spray cooling equipment will be promptly handled upon receipt. Quotations or shipment will be promptly made.



A COMPLETE SPRAY POND SERVICE

Besides maintaining complete stocks of spray cooling equipment —Marley offers a complete Spray Pond Service. Marley engineers are prepared to investigate, to design and to guarantee the performance of spray ponds. The fact too, that the majority of spray pond installations in the southwest during the past several years have been made by Marley—indicate the success with which they operate.



SEND FOR NEW CATALOG
—CONTAINS IMPORTANT SPRAY POND INFORMATION

POWER PLANT EQUIPMENT CO.
COCA COLA BLDG., KANSAS CITY, MO.

MAR·LEY
SPRAY COOLING EQUIPMENT

Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Essex Brass Corp., 2000 Franklin St., Detroit, Mich.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Frederick Iron & Steel Co., Frederick, Md.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
M. W. Jamieson & Co., 1309 Fourth Ave., Warren, Pa.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Le Courtenay Co., 4 Maine, Newark, N. J.
The Lima Pump & Supply Company, Lima, Ohio.
Lobee Pump & Machinery Co., 119-129 Dearborn St., Buffalo, N. Y.
Mast, Foos & Co., Springfield, Ohio.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
McCullough Mfg. Co., 2632-34 Central Ave., Minneapolis, Minn.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Works, Upper Sandusky, Ohio.
National Supply Co., Toledo, Ohio
North American Mfg. Co., 8918 Frederick Ave., Cleveland, Ohio.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Pipe Line

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blake Pump Co., Fitchburg, Mass.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Domestic Engine & Pump Co., Shippensburg, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
M. W. Jamieson & Co., 1309 Fourth Ave., Warren, Pa.
Le Courtneay Co., 4 Maine, Newark, N. J.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Power

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn, N. Y.
American Steam Pump Co., Battle Creek, Mich.
Aurora Pump & Mfg. Co., Aurora, Ill.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Beach-Russ Co., 30 Church St., New York, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Blake Pump Co., Fitchburg, Mass.
Bovts, Porter & Co., Connellsville, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Connersville Blower Co., Connersville, Ind.

Continental Supply Co., St. Louis, Missouri
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Domestic Engine & Pump Co., Shippensburg, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
R. B. Everett Co., Houston, Texas
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Gardner-Governor Co., Quincy, Ill.
F. W. Gartner Co., Houston, Texas.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Hercules Supply Co., Corsicana, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Humphreys Mfg. Co., Mansfield, O.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Langstadt-Meyer Co., Appleton, Wis.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Le Courtneay Co., 4 Maine, Newark, N. J.
The Lima Pump & Supply Company, Lima, Ohio.
Lobee Pump & Machinery Co., 119-129 Dearborn St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Luitwieler Pumping Engine Co., Rochester, N. Y.
Mast, Foos & Co., Springfield, Ohio.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsbugh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Rotary

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
WEIMAR ENGINEERING WORKS, Westmoreland & Jasper Sts., Philadelphia, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis, Missouri
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Deming Co, Salem, Ohio
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Garden City Fan Co., McCormick Bldg., Chicago, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Kruger & Blind Co., 513 Master St., Philadelphia, Pa.
Lamert & Mann Co., Wood & Waknut Sts., Chicago, Ill.
Lobee Pump & Machinery Co., 119-129 Dearborn St., Buffalo, N. Y.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Pittsburgh Machine Tool Co., Corry Ave., Braddock, Pa.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
The P. H. & F. M. Roots Co., Connersville, Ind.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Westco-Chippewa Pump Co., Davenport, Iowa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Rotary Air

Kruger & Blind Co., 513 Master St., Philadelphia, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Rotary, Motor Driven

Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Rotary Vacuum

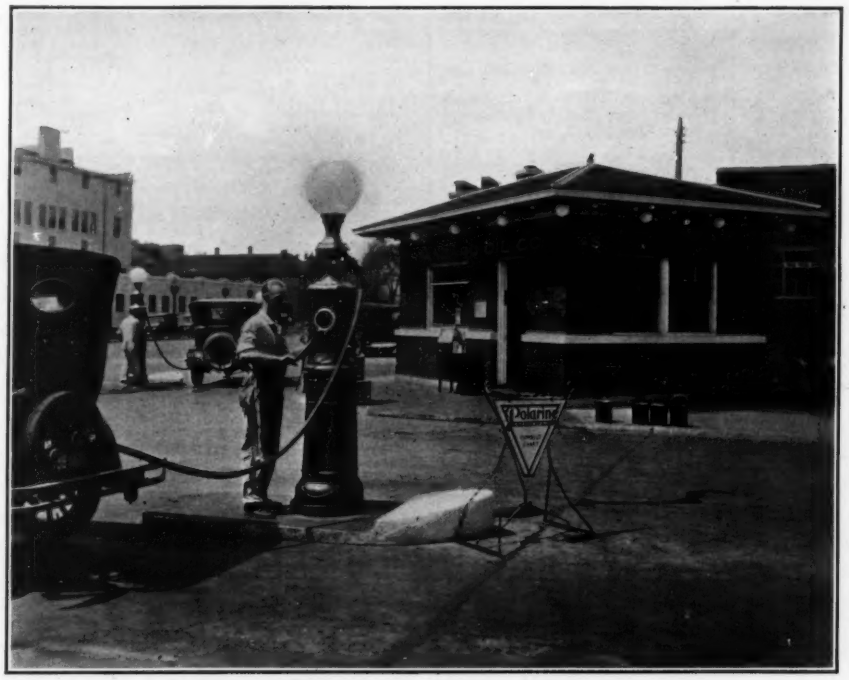
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
Kruger & Blind Co., 513 Master St., Philadelphia, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Screw

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Simplex

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
Blakeslee Mfg. Co., Du Quoin, Ill.



An installation of "U. S." Giant Filling Station Hose.

How many dollars pass through your gasoline hose every day?

Your gasoline hose should be your most dependable employee. Through its lengths each day pass every dollar of your gasoline profits.

Safeguard these profits by standardizing on "U. S." Giant Filling Station Hose—a master product of the world's largest rubber manufacturer.

Every length is guaranteed to give satisfactory, dependable service. Equipped with "U. S." Replaceable Couplings, which are readily and quickly attached or detached on the job—when repair is necessary.

Standardize on "U. S." Giant Gasoline Hose!

United States Rubber Company

1790 Broadway **New York City**
BRANCHES IN EVERY *OIL FIELD CENTER*

"U. S." GIANT GASOLINE HOSE

FILLING STATION TANK CAR TANK WAGON

Boyts, Porter & Co., Connellsville, Pa.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Connersville Blower Co., Connersville, Ind.
Dean Bros. Pump Co., Indianapolis, Ind.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Domestic Engine & Pump Co., Shippensburg, Pa.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Single Cylinder Steam

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 56. Washington Blvd., Chicago, Ill.
American Steam Pump Co., Battle Creek, Mich.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Blakeslee Mfg. Co., Du Quoin, Ill.
Boyts, Porter & Co., Connellsville, Pa.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Wks, Inc., 36 Bridge St., Brooklyn, N. Y.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank High St., Newark, N. J.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Sludge

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Domestic Engine & Pump Co., Shippensburg, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
D. A. Hinman & Co., Sandwich, Ill.
Humphreys Mfg. Co., Mansfield, O.
Latta-Martin Pump Co., Hickory, N. C.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Shartle Bros. Machine Co., Middletown, Ohio.
T. Shriver & Co., 844 Hamilton St., Harrison, N. J.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Titusville Iron Works, Titusville, Pa.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia
Wagener Steam Pump Co., Canton Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago
Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
American Steam Pump Co., Battle Creek, Mich.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bethlehem Shipbuilding Corp., Betalehem, Pa.
Boyts, Porter & Co., Connellsville, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Emerson Pump & Valve Co., Inc., Alexandria, Va.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
R. B. Everett Co., Houston, Texas
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Works, Inc., 36 Bridge St., Brooklyn, N. Y.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
F. W. Gartner Co., Houston, Texas.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
M. W. Jamieson & Co., 1309 Fourth Ave., Warren, Pa.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Works, Upper Sandusky, Ohio.
National Supply Co., Toledo, Ohio
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Pulsometer Steam Pump Co., 220 W. 42d St., New York, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Steam Jacketed

Geo. D. Roper Corp., Rockford, Ill.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, N. Y.

PUMPS, Stripping

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.

American Steam Pump Co., Battle Creek, Mich.
Deming Co, Salem, Ohio
Gardner-Governor Co., Quincy, Ill.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Twinvolute Pump Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Tank

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Beach-Russ Co., 30 Church St., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Blakeslee Mfg. Co., Du Quoin, Ill.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co., 85 W. Broad St., Columbus, O.
Continental Supply Co., St. Louis, Missouri
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis, Ind.
Deming Co, Salem, Ohio
Economy Pumping Machinery Co., 104-18 N. Curtis St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Foster Pump Works, Inc., 36 Bridge St., Brooklyn, N. Y.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill.
Gilbert & Barker Mfg. Co., Springfield, Mass.
Guild & Garrison, 463 Kent Ave., Brooklyn, N. Y.
Humphreys Mfg. Co., Mansfield, O.
Kinney Mfg. Co., 3529-3541 Washington St., Boston, Mass.
Le Courtenay Co., 4 Maine, Newark, N. J.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Mast, Foos & Co., Springfield, Ohio.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Geo. D. Roper Corp., Rockford, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Sexton Can Company, Inc., 123 Broad St., Boston, Mass.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.

Viking Pump Co., Cedar Falls, Ia.
Vogt Brothers Mfg. Co., 1402 W Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.
Yoemans Bros., Co., 1426 Dayton St., Chicago, Ill.

PUMPS, Transfer

Moncrief-Lenoir Mfg. Co., Houston, Texas
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Turbine

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
American Steam Pump Co., Battle Creek, Mich.
The American Well Works, Aurora, Illinois.
Aurora Pump & Mfg. Co., Aurora, Illinois.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Frederick Iron & Steel Co., Frederick, Md.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Byron Jackson Pump Mfg. Co., Inc., S. San Pedro St., Los Angeles, Calif.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Le Courtenay Co., 4 Maine, Newark, N. J.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pennsylvania Pump & Compressor Co., Easton, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Terry Steam Turbine Co., Hartford, Conn.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Weinman Pump Mfg. Co., Columbus, Ohio.
Westco-Chippewa Pump Co., Davenport, Iowa.
Wilson-Snyder Manufacturing Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMPS, Vacuum

THE BESSMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.
GOULDS PUMPS, INC., Seneca Falls, N. Y. See Advertisers' Index.

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa Okla. See Advertisers' Index.
ROSS HEATER & MFG. CO INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
WEIMAR ENGINEERING WORKS, Westmoreland & Jasper Sts., Philadelphia, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 14 Broadway, New York, N. Y See Advertisers' Index.

Adkins, Young & Allen Co., 56 Washington Blvd., Chicago, Ill.
Allen & Billmyre Co., Inc., Grand Central Palace, New York City N. Y.
American Machinery & Foundry Co., 5520 Second Ave., Brooklyn N. Y.
American Steam Pump Co., Battle Creek, Mich.
Austin-Mason Co., 15 Park Row New York, N. Y.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canad.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
Beach-Russ Co., 30 Church St. New York, N. Y.
Braun-Knecht Heimann Co., 57 Mission St., San Francisco, Cal
Buffalo Steam Pump Co., 490 Broadway, Buffalo, N. Y.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Chicago Pneumatic Tool Co., 6 E 44th St., New York, N. Y.
Chicago Pump Co., 2336 Wolfram St., Chicago, Ill.
Columbus Steam Pump Works Co 85 W. Broad St., Columbus, O.
Connersville Blower Co., Connersville, Ind.
Continental Supply Co., St. Louis Missouri
Croll-Reynolds Eng'rg. Co., Inc. 95 Liberty St., New York, N. Y
M. T. Davidson Co., 154 Nassau St., New York, N. Y.
Dean Bros. Pump Co., Indianapolis Ind.
J. P. Devine Co., 1380 Clinton Buffalo, N. Y.
Economy Pumping Machinery Co. 104-18 N. Curtis St., Chicago, Ill
Emerson Pump & Valve Co., Inc. Alexandria, Va.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Furness Bros. Co., 1615 W. Walnut St., Chicago, Ill.
Gardner-Governor Co., Quincy, Ill
Guild & Garrison, 463 Kent Ave. Brooklyn, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway New York, N. Y.
The Kellogg-Mackay Co., 2020-3 Walnut St., Kansas City, Mo.
Kitts Mfg Co., Oswego, N. Y.
Kruger & Blind Co., 513 Master St., Philadelphia, Pa.
Lamert & Mann Co., Wood & Walnut Sts., Chicago, Ill.
Leiman Bros., 23 Walker St., New York, N. Y.
The Lima Pump & Supply Company, Lima, Ohio.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
May Machinery Co., Second National Bank Bldg., Houston, Tex
John H. McGown Co., 910 4th Natl. Bk. Bldg., Cincinnati, Ohio
Mesta Machine Co., Pittsburgh, Pa.
Miller Improved Gas Engine Co. Springfield, Ohio.
National Steam Pump Wks., Upper Sandusky, Ohio
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh Pa.
Oliver Continuous Filter Co., Oakland, Calif.
Palo Company, 153 W. 23rd St., New York, N. Y.
Pennsylvania Pump & Compressor Co., Easton, Pa.
The P. H. & F. M. Roots Co., Connersville, Ind.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex
Scranton Pump Co., Scranton, Pa.
Southern Engine & Pump Co., Houston, Texas

Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Trane Co., LaCrosse, Wis. Ave., Rochester, N. Y.
Twinvolute Pump & Mfg. Co., 216 High St., Newark, N. J.
Union Steam Pump Co., Battle Creek, Mich.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Wagener Steam Pump Co., Canton, Ohio.
Weinman Pump Mfg. Co., Columbus, Ohio.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway, New York, N. Y.

PUMP PARTS, Boiler Feed

Gulf Coast Machine & Supply Co Beaumont, Texas.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway New York, N. Y.

PUMP PARTS, Pipe Line

Gulf Coast Machine & Supply Co Beaumont, Texas.
Worthington Pump & Machinery Corp., Room 1820, 115 Broadway New York, N. Y.

PUMP RODS

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

Bridgeport Brass Co., Bridgeport Conn.
Carbondale Machine Co., Carbondale, Pa.
Continental Supply Co., St. Louis Missouri
Cyclops Steel Co., Titusville, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Langstadt-Meyer Co., Appleton Wis.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh Pa.
A. R. Purdy Co., Inc., 790 Greenwich St., New York, N. Y
United Alloy Steel Corp., Canton Ohio.

PUNCHES

A. L. HENDERER'S SONS Maryland Ave. & Beech St. Wilmington, Delaware. See Advertisers' Index.

Continental Supply Co., St. Louis Missouri
May Machinery Co., Second National Bank Bldg., Houston, Tex
R. S. Newbold & Son Co., Norristown, Pa.
Paragon Machine Co., 77 South Ave., Rochester, N. Y.
Joseph T. Ryerson & Sons, 2558 W 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

PUNCHES, Hydraulic

Richard Dudgeon, Inc., New York N. Y.

PUNCHES, Pneumatic

F. F. Slocomb & Co., Inc., Wilmington, Del.

PUNCHES, Screw

A. L. HENDERER'S SONS Maryland Ave., & Beech St. Wilmington, Dela. See Advertisers' Index.

PURIFIERS, Ammonia

HAMMOND IRON WORKS, P O. Box 788, Warren, Pa. See Advertisers' Index.
THE VILTER MFG. CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.

American Gas Construction Co Newton, Iowa
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Carbondale Machine Co., Carbondale, Pa.

J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Frick Co., Inc., Waynesboro, Pa.
Petroleum Iron Works, Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

PURIFIERS, Feed Water

GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

American Water Softener Co., Lehigh Ave. at Fourth St., Philadelphia, Pa.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Brock Engineering Co., Arcade Bldg., St. Louis, Mo.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Dearborn Chemical Co., 310 S. Michigan Ave., Chicago, Ill.
D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
The Fulton Foundry & Machine Co., E. 75th & Morgan Ave., Cleveland, Ohio.
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.
International Filter Co., 335 W. Twenty-Fifth Place, Chicago, Ill.
Marshall Heater Co., 724 E. Monument Ave., Dayton, Ohio.
Moffat Feed Water Heater & Purifier Co., 724 E. Monument Ave., Dayton, Ohio.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Perelin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Petroleum Iron Works, Sharon, Pa.
Reisert Automatic Water Purifying Co., 23 E. 26th St. New York, N. Y.
Roberts Filter Mfg., Co., 6th and Columbia Ave., Darby, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Wm. Scaife & Sons Co., Oakmont, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City Mo.

PURIFIERS, Oil

ANDREWS BRADSHAW CO., 530 Fourth Ave., Pittsburgh, Pa. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.

Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Petroleum Iron Works, Sharon, Pa.
The Sharples Specialty Co., 23rd and Westmoreland Sts., Philadelphia, Pa.

PURIFIERS, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
ANDREWS - BRADSHAW CO., 533 Fourth Ave., Pittsburgh, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Tennant Co., Union National Bank Bldg., Houston, Texas.

PYROMETERS

ANDREWS - BRADSHAW CO., 533 Fourth Ave., Pittsburgh, Pa. See Advertisers' Index.
THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., Inc., Foxboro, Mass. See Advertisers' Index.

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Gas Construction Co., Newton, Iowa
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Griebel Instrument Co., Carbondale, Pa.
Hoskins Mfg. Co., 4437 Lawton Ave., Detroit, Mich.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Price Mfg. Co., 12369 Euclid Ave., Cleveland, Ohio.
Pyrolectric Instrument Co., Easton, Pa.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Taylor Instrument Co., Rochester, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
Western Gas Construction Co., Fort Wayne, Ind.
Wilson Maeulen Co., 383 Concord Ave., New York, N. Y.
A. Zaubitz, 95-97 Cliff St., New York, N. Y.

R

RACKS, Bar

Berger Mfg. Co., Canton, Ohio
Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Economy Engineering Co., 2635 W. Van Buren St., Chicago, Ill.
Erie City Iron Works, Erie, Pa.
Lyon Metallic Mfg. Co., Aurora, Ill.
Moloch Co., Kaukauna, Wis.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
New York Machinery Co., 200 Fifth Ave., New York, N. Y.
United Alloy Steel Corp., Canton, Ohio.

RACKS, Barrel Storing

Economy Engineering Co., 2635 W. Van Buren St., Chicago, Ill.
Erie City Iron Works, Erie, Pa.
Homer Strong & Co., Inc., 301-307 State St., Rochester, N. Y.
Lyon Metallic Mfg. Co., Aurora, Ill.
New York Machinery Co., 200 Fifth Ave., New York, N. Y.
United Alloy Steel Corp., Canton, Ohio.

RACKS, Steel

Berger Mfg. Co., Canton, Ohio
Charles Bond Co., 617-619 Arch St., Philadelphia, Pa.
Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Economy Engineering Co., 2635 W. Van Buren St., Chicago, Ill.
Erie City Iron Works, Erie, Pa.
Homer Strong & Co., Inc., 301-307 State St., Rochester, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lyon Metallic Mfg. Co., Aurora, Ill.
Moloch Co., Kaukauna, Wis.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
New York Machinery Co., 200 Fifth Ave., New York, N. Y.
E. Van Noorden Co., 100 Magazine St. Roxbury, Mass.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
United Alloy Steel Corp., Canton, Ohio.

RAGS, Wiping

Houston Waste & Fibre Mills, Houston, Texas.

REAGENTS, Chemical

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.

RECEIVERS, Air

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Bouston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Chicago Steel Car Co., Chicago, Illinois.
Crowell Mfg. Co., 315 Franklin Ave., Brooklyn, N. Y.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Lucas Pump & Tool Co., 427 Valley St., Dayton, Ohio
May Machinery Co., Second National Bank Bldg., Houston, Tex.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
National Supply Co., Toledo, Ohio.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
The Petroleum Iron Works Co., Sharon, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pa.
Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Wm. Scaife & Sons Co., Oakmont, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Standard Tank Car Co., Sharon, Pa.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Treadwell Construction Co., Midland, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

RECIRCULATING EQUIPMENT

B. P. LIENTZ & CO., Kansas City, Mo. See Advertisers' Index.

RECORDERS, (Also see Instruments)

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Bacharach Industrial Instrument Co., 7000 Bennett St., Homewood Sta., Pittsburgh, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Ernest H. DuVivier, 30 Church St., New York, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
W. & L. E. Gurley, Troy, N. Y.
The Hays Corporation, Michigan City, Ind.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Republic Flow Meters Co., 2236 Diversey Parkway, Chicago, Ill.
C. J. Tagliabue Mfg. Co., 18 33rd st., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Uehling Instrument Co., 475 Getty Ave., Paterson, N. J.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

RECORDERS, Motion and Operation

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.

RECORDERS, POSITION

Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.

RECORDERS, Speed

Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.

RECOVERY PLANTS Sludge Acid

Geo. F. Hart Engineering Corp., 52 Vanderbilt Ave., New York, N. Y.

RECTIFYING COLUMNS

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertis-
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
THE WINKLER-KOCH ENGINEERING CO., 429 First Natl. Bank Bldg., Wichita, Kansas. See Advertisers' Index.

J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Ernest H. DuVivier, 30 Church St., New York, N. Y.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.

RECUPERATORS

THE CALORIZING CO., Wilkinsburg, Pa. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

W. S. Rockwell Co., 50 Church St., New York, N. Y.
Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

REDUCERS, Speed

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.

The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Hoist & Crane Eng. Co., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
R. D. Nuttall Company McCandless & Harrison Avenues, Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Union Engineering Co., Cleveland, Ohio.
T. B. Wood's Sons Co., Chambersburg, Pa.

REFRACTOMETERS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Arthur H. Thomas Co., W. Washington Square, Philadelphia, Pa.

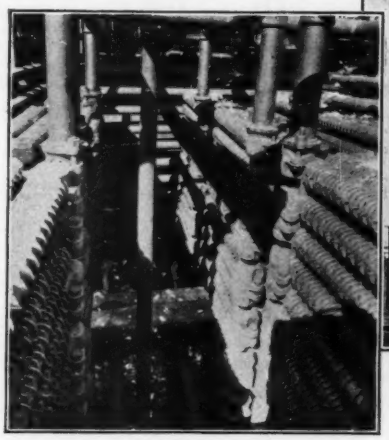
REFRACTORIES

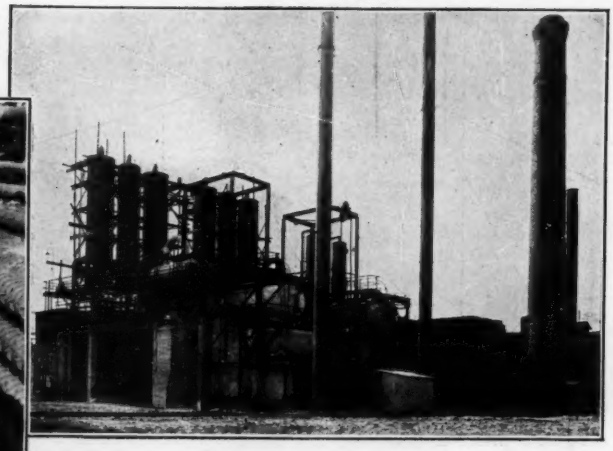
ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BOTFIELD REFRACTORIES CO., Swanson & Clymer Sts., Philadelphia, Pa. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
PLIBRICO JOINTLESS FIREBRICK CO., 1865 Kingsbury St., Chicago, Ill. See Advertisers' Index.
QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
Drake Non-Clinkering Furnace Block Co., 5 Beekman St., New York, N. Y.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
James Gardner, Jr., Co., Ebensburg, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
King Refractories Co., Inc., 1709 Niagara St., Buffalo, N. Y.
McLeod & Henry Co., Troy, N. Y.
Norton Co., Worcester, Mass.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.

STERLING

Twin Unit of Jenkins Still





STERLING Oil Refining Sections used in Jenkins Cracking Process Installations

STERLING OIL SECTIONS
RESIST CORROSION—SAVE SPACE
And are IMMEDIATELY ACCESSIBLE

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7 Skelly Oil Co., Eldorado, Kans.
1 Shreveport Producing & Refining Corp., Shreveport, La.
2 Peerless Oil & Refining Co., Chanute, Kans.
2 Kanotex Refining Co., Arkansas City, Kans.
2 Bolene Refining Co., Enid, Okla.
1 Independent Oil & Gas Co., Okmulgee, Okla.
1 Terminal Oil & Refining Co., Houston, Texas.
1 White Eagle Oil & Refining Co., Casper, Wyoming
1 Golden Rule Refining Co., Wichita, Kans.
1 Garber Refinery Co., Garber, Okla.
2 Bartles-Macguire Oil Co., East Chicago, Ind.

For these reasons the Graver Corp. have installed STERLING OIL SECTIONS and accessories in the 22 Jenkins Process Units, erected at the refineries listed to the left.

STERLING OIL SECTIONS were adopted for this service for the very obvious reasons, that they increase the life of the condensers by successfully resisting corrosion; afford materially increased efficiency; are of exceptionally low maintenance cost; and are immediately accessibile. Besides they save from 20% to 50% space.

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United States Refractories Corp'n., Mount Union, Pa.
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UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
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HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

American Engineering Co., Philadelphia, Pa.
Arctic Ice Machine Co., Canton, Ohio
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Audiffren Refrigerating Machine Co., 285 Madison Ave., New York, N. Y.
Automatic Refrigerating Co., Hartford, Conn.
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Buffalo Refrigerating Machine Co., 39 Lafayette St., Brooklyn, N. Y.
Carbondale Machine Co., Carbondale, Pa.
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Frick Co., Inc., Waynesboro, Pa.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Jarvis Engineering Co., 51 Ellery St., Boston, Mass.
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Milwaukee Steam Appliance Co., West Allis, Wis.
National Supply Co., Toledo, Ohio
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
Southern Engine & Pump Co., Houston, Texas
Triumph Electric Co., Cincinnati, Ohio
Wittenmeier Machinery Co., 852 N. Spaulding Ave., Chicago, Ill.
York Products Corporation, Houston, Texas.

REFRIGERATORS, Electric

Langstadt-Meyer Co., Appleton, Wis.

REGULATORS, Automatic

Refrigerating Specialties Co., 714 So. Sacramento Blvd., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.

REGULATORS, Boiler Feed

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN-FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Atlas Valve Co., 282 South St., Newark, N. J.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
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Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
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McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oil Well Supply Co., Pittsburgh, Pa.
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Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

REGULATORS, Combustion

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., 17 Battery Place, New York, N. Y.
Julian d'Este Co., 26 Canal St., Boston, Mass.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Mason Regulator Co., Boston, Mass.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Power Turbo Blower Co., 350 Madison Ave., New York, N. Y.
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Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.

REGULATORS, Damper

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Atlas Valve Co., 282 South St., Newark, N. J.
F. A. Burrows Mfg. Co., 41-45 N. Water St., York, Pa.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
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Eastwood Wire Mfg. Co., Belleville, N. J.
Engineer Co., 17 Battery Place, New York, N. Y.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
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Plouff Co., 170 Summer St., Boston, Mass.
Power Turbo Blower Co., 350 Madison Ave., New York, N. Y.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
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The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
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Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
Stickle Steam Specialties Co., Indianapolis, Ind.
Trane Co., LaCrosse, Wis.
Watts Regulator Company, 250-252 Lowell St., Lawrence, Mass.

REGULATORS, Draft

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Boiler Engineering Co., 760 Broad St., Newark, N. J.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Engineer Co., 17 Battery Place, New York, N. Y.
Honeywell Heating Specialties Co., Wabash, Ind.
International Heater Co., 101 Park Ave. Utica, N. Y.
Mason Regulator Co., Boston, Mass.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill
Plouff Co., 170 Summer St., Boston, Mass.
Power Turbo Blower Co., 350 Madison Ave., New York, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Texas.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.

REGULATORS, Engine

GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
Walworth Company, 88 Pearl St., Boston, Mass.

Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
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Mason Regulator Co., Boston, Mass.
Plouff Co., 170 Summer St., Boston, Mass.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Watts Regulator Company, 250-252 Lowell St., Lawrence, Mass.

REGULATORS, Engine Fan

Mason Regulator Co., Milton, Mass.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.

REGULATORS, Feed Water

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN-FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston Mass. See Advertisers' Index.

American Schaffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.

Atlas Valve Co., 282 South St., Newark, N. J.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
F. A. Burrows Mfg. Co., 41-45 N. Water St., York, Pa.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Kitts Mfg Co., Oswego, N. Y.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Watts Regulator Company, 250-252 Lowell St., Lawrence, Mass.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

REGULATORS, Field Dynamo

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

Houston Armature Works, Houston, Texas

REGULATORS, Gas

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
THE REFINERY SUPPLY CO., Fourth & Detroit Sts., Tulsa, Okla. See Advertisers' Index.
WESTCOTT & GREIS, INC., Tulsa, Okla. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carbic Mfg. Co., Duluth, Minn.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Continental Supply Co., St. Louis, Missouri
Davis Bouronville Co., 141-43 W. Austin Ave., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Henderson-Willis Welding & Cutting Co., 2305-09 N. Eleventh St., St. Louis, Mo.
Honeywell Heating Specialties Co., Wabash. Ind.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
H. Mueller Mfg Co., Decatur, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Torchweld Equipment Co., 224 No Carpenter St., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Cal.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Heat

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

American Thermostat Co., 226 Jeliff Ave., Newark, N. J.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Honeywell Heating Specialties Co., Wabash. Ind.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.

REGULATORS, Oil Level

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Okla. City, Okla.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Engineering Co., Newark, N. J.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy N. Y.
C. J. Tagliabue Mfg., Co., 18 33rd St., Brooklyn, N. Y.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

REGULATORS, Pressure

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
American District Steam Co. North Tonawanda, N. Y.
American Schaffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Okla. City, Okla.
Atlas Valve Co., 282 South St., Newark, N. J.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carbic Mfg. Co., Duluth, Minn.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Engineer Co., 17 Battery Place, New York, N. Y.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Foster Engineering Co., Newark, N. J.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kitts Mfg Co., Oswego, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Modern Engineering Co., 3411-13 Pine Blvd., St. Louis, Mo.
H. Mueller Mfg Co., Decatur, Ill.
National Oxygen Co., 5811 W. 66th St., Chicago, Ill.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Automatic Pressure

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN-FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO. Marshalltown, Iowa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
GREENE BROS., 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO. Tulsa, Okla. See Advertisers' Index.

American Schaffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Okla. City, Okla.
Atlas Valve Co., 282 South St., Newark, N. J.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.

Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Houston Armature Works, Houston, Texas
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Magnolia Gas Products, Houston, Texas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City. land, Ohio.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
H. Mueller Mfg Co., Decatur, Ill.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Union Water Meter Co., Worcester, Mass.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Auxiliary Pressure

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Foster Engineering Co., Newark, N. J.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem, Mass.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
H. Mueller Mfg. Co., Decatur, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Stickle Steam Specialties Co., Indianapolis, Ind.
Watts Regulator Company, 250-252 Lowell St., Lawrence, Mass.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.

REGULATORS, Back Pressure

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn. Ave., Pittsburgh, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
F. A. Burrows Mfg. Co., 41-45 N. Water St., York, Pa.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Foster Engineering Co., Newark, N. J.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem, Mass.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brookly, N. Y.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Cal.

REGULATORS, Steam Pressure

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advetrisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American District Steam Co. North Tonawanda, N. Y.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Atlas Valve Co., 282 South St., Newark, N. J.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Engineer Co., 17 Battery Place, New York, N. Y.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Honeywell Heating Specialties Co., Wabash. Ind.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
H. Mueller Mfg. Co., Decatur, Ill.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg., Co., 18 33rd St., Brooklyn, N. Y.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Water Pressure

Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.

REGULATORS, Speed

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Mason Regulator Co., Milton, Mass.
Plouff Co., 170 Summer St., Boston, Mass.
The P. H. & F. M. Roots Co., Connersville, Ind.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

REGULATORS, Stoker

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.

Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Engineer Co., 17 Battery Place, New York, N. Y.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Foster Engineering Co., Newark, N. J.
Kitts Mfg Co., Oswego, N. Y.
Locke Regulator Co., Salem, Mass.
Mason Regulator Co., Boston, Mass.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Spencer Regulator Co., Cor. Derby & Liberty Sts., Salem, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.

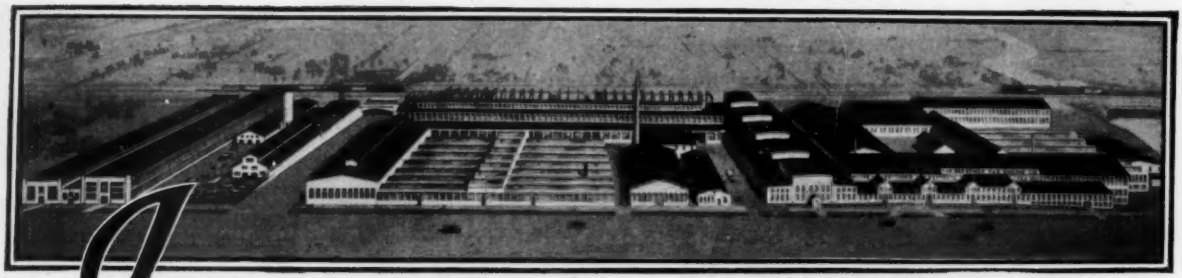
REGULATORS, Tank

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

REGULATORS, Temperature

THE BRISTOL CO., Watrbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa Okla. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Thermostat Co., 226 Jeliff Ave., Newark, N. J.
Atlas Valve Co., 282 South St., Newark, N. J.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
Carrier Engineering Corp., 750 Frelinghuysen Ave., Newark, N. J.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Honeywell Heating Specialties Co., Wabash. Ind.
Hoskins Mfg. Co., 4437 Lawton Ave., Detroit, Mich.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.



Immediate delivery—on Bessemer Type Ten Compressors—for both high and low pressure work

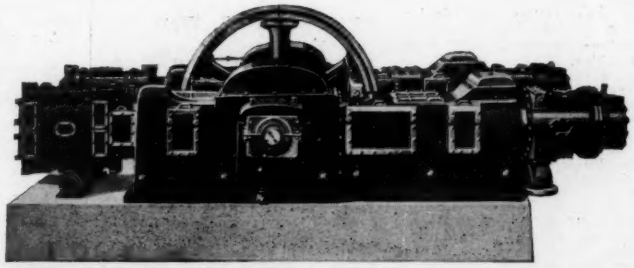
THE BESSEMER FACTORY can make Immediate deliveries on Type Ten Compressors—both with special cylinders for high pressure work or with standard cylinders for lower pressures for gasoline plant work.

Someone started the rumor that Bessemer Type Tens were sold out for months ahead. This is not exact. True, the huge Bessemer Factory is working at capacity to meet the enormous demand for these popular compressors, but greatly increased production facilities have enabled Bessemer to keep pace with the ever-increasing orders. Additional plant space, new machinery and 1,600 skilled workers enable the Bessemer factory to ship Type Tens as fast as the orders are received at the factory.

In spite of the large and growing demand for Type Tens with special high pressure cylinders for flowing wells and for the standard units for gasoline plant work, you can get Bessemers (the best by proven performance) *immediately*. Of course, Bessemer in doing a tremendous business—sheer merit has built it up—but their plant capacity is tremendous too.

You *can* get Bessemers *now!* Don't be misled into buying stop-gap equipment when you can get known performance, known reliability—known quality—Bessemers.

THE BESSEMER GAS ENGINE COMPANY
13 York Street ∴ ∴ Grove City, Pa.



BESSEMER

BESSEMER OIL FIELD ENGINES — COMPRESSORS VACUUM PUMPS — ROLLER PUMPING POWERS

Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Wilson Maeulen Co., 383 Concorn Ave., New York, N. Y.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Cal.

REGULATORS, Automatic Temperature

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Moonroe St., Fort Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

American Gas Furnace Co., Lafayette, Spring and Elizabeth St., Elizabeth, N. J.
American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Thermostat Co., 226 Jeliff Ave., Newark, N. J.
Atlas Valve Co., 282 South St., Newark, N. J.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Honeywell Heating Specialties Co., Wabash. Ind.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Geo. A. Weld & Co., 80 Federal St., Boston, Mass.

REGULATORS, Vacuum

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburg, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Oklahoma City, Okla.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Engineering Co., Newark, N. J.
Honeywell Heating Specialties Co., Wabash. Ind.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Kitts Mfg Co., Oswego, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem. Mass.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Oliver Continuous Filter Co., Oakland, Calif.
Plouff Co., 170 Summer St., Boston, Mass.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Water Heater

BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
GREENE BROTHERS, 524 - 8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Atlas Valve Co., 282 South St., Newark, N. J.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Foster Engineering Co., Newark, N. J.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
H. Mueller Mfg. Co., Decatur, Ill.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.

REGULATORS, Water Level

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THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advertisers' Index.
THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO. Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Okla. City, Okla.
Atlas Valve Co., 282 South St., Newark, N. J.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
F. A. Burrows Mfg. Co., 41-45 N. Water St., York, Pa.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Foster Engineering Co., Newark, N. J.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Illinois Engineering Co., Racine Ave. and 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouf Co., 170 Summer St., Boston, Mass.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Williams Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

REGULATORS, Welding

Cox Brass Mfg Co., Albany, N. Y.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.

RELAYS

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

RESISTORS

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

RESPIRATORS

MINE SAFETY APPLIANCES CO., 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.
PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Continental Supply Co., St. Louis, Missouri
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
Improved Aluminum Gaso Protector Co., 7216 Ridge Blvd., Chicago, Ill.
Kolesch & Co., 138 Fulton St., New York, N. Y.

RESUSCITATION EQUIPMENT, Inhalators

MINE SAFETY APPLIANCE CO. 908-12 Chamber of Commerce Bldg., Pittsburgh, Pa. See Advertisers' Index.

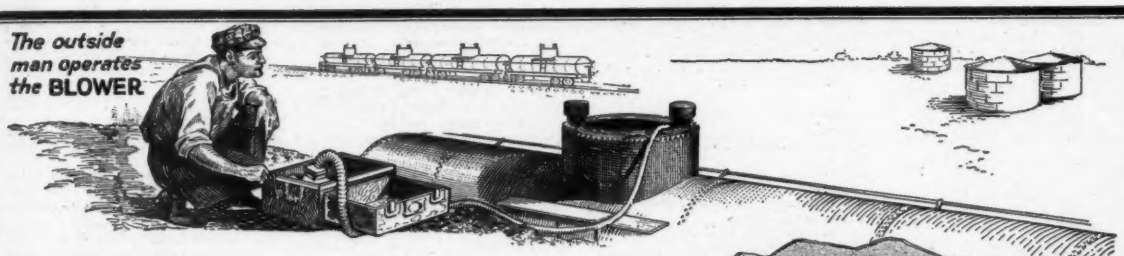
RETORTS, Gas

American Gas Construction Co., Newton, Iowa

RETURN BENDS

HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
THE OHIO STEEL FOUNDRY CO., Springfield, Ohio. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
THE VILTER MANUFACTURING CO., 936 Milwaukee St., Milwaukee, Wis. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Arctic Ice Machine Co., Canton, Ohio
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Carbondale Machine Co., Carbondale, Pa.
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Hartwell Iron Works, Houston, Texas
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
Milwaukee Steam Appliance Co., West Allis, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.



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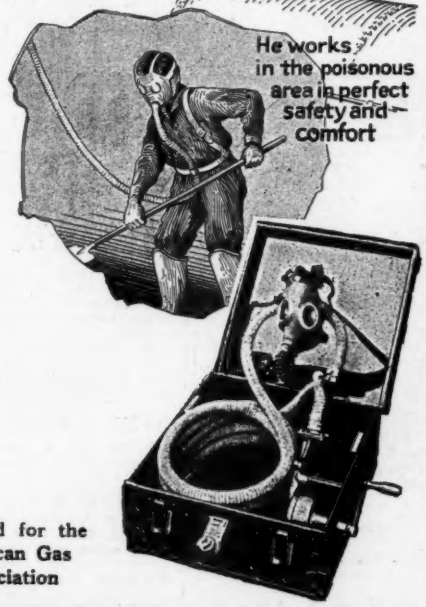

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John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
Utility Mfg. Co., Cudahy, Wis.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

RETURN BENDS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

RETURN SYSTEMS, Condensation

Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Rider-Erickson Engine Corp., 11 Broadway, New York, N. Y.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Trane Co., LaCrosse, Wis.

RHEOSTATS

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

James G. Biddle, 1211-1213 Arch St., Philadelphia, Pa.

RINGS, Asbestos Packing

Keasbey & Mattison Co., Ambler, Pa.

RINGS, Chemical

FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.

RINGS, Pump Packing

Keasbey & Mattison Co., Ambler, Pa.

RINGS, Valve

Judd & Leland Mfg. Co., Clifton Springs, N. Y.

RIVETERS, Pneumatic

Canton Pneumatic Co., Canton Ohio.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Hanna Engineering Works, 1769 Elston Ave., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Wm. H. Keller, Inc., Grand Haven, Mich.
King Pneumatic Tool Co., 1733 Armitage Ave., Chicago, Ill.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
National Supply Co., Toledo, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
F. F. Slocomb & Co., Inc., Wilmington, Del.
Tennant Co., Union National Bank Bldg., Houston, Texas.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

RIVETS

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Brass Co., Waterbury, Conn.
Bethlehem Steel Co., Bethlehem, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Kansas City Structural Steel Co., Kansas City, Kansas.
Mesher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
The Stanwood Corp., Cincinnati, O.
Texas Carnegie Steel Assn., Galveston, Texas.
Wm. Wharton, Jr. & Co., Inc., 30 Church St., New York, N. Y.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

RIVETS, Rubber

La Favorite Rubber Mfg. Co. Wagaraw Rd., Hawthorne, N. J.

RIVETS, Sets

NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.

Bethlehem Steel Co., Bethlehem, Pa.
Canton Pneumatic Co., Canton Ohio.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Wm. H. Keller, Inc., Grand Haven, Mich.
King Pneumatic Tool Co., 1733 Armitage Ave., Chicago, Ill.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
National Supply Co., Toledo, Ohio
Rivet Cutting Gun Co., 125 E. 3rd St., Cincinnati, Ohio.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.

RIVET BUSTERS

W. N. Best Furnace & Burner Corp., 11 Broadway, New York, New York.
Brazelton, Wessendorff & Nelms, Houston, Texas.
N. C. Davison Gas Burner & Welding Co., 2939 Smallman St., Pittsburgh, Pa.
George J. Hagan Co., 1301 Chamber of Commerce Bldg., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
May Machinery Co., Second National Bank Bldg., Houston, Tex.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Rivet Cutting Gun Co., 125 E. 3rd St., Cincinnati, Ohio.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Tennant Co., Union National Bank Bldg., Houston, Texas.

ROOFING, Asbestos and Rag Felt

Philip Carey Co., Cincinnati, Ohio

ROOFING, Asphalt

The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.

ROOFING, Corrugated

JOHNS - MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Rolling Mill Co., Middletown, Ohio
R. V. Aycock Co., Kansas City, Mo.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Supply Co., St. Louis, Missouri
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Philip Carey Co., Cincinnati, Ohio
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond. Va.
Rogers Asbestos Co., Houston. Texas
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago. Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Thorn, J. S. Co., 12th and Allegheny Ave., Philadelphia, Pa.
United Alloy Steel Corp., Canton, Ohio.

ROOFING, Prepared

Paraffine Cos. Inc., San Francisco. Calif.

RUBBER GOODS, Mechanical

THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Continental Supply Co., St. Louis, Mo.
Diamond Rubber Co., Inc., Akron. Ohio.
B. F. Goodrich Rubber Co., Akron, Ohio
Hercules Supply Co., Corsicana, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
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The Manhattan Rubber Mfg. Co., Passaic. N. J.
Miller Rubber Co. of New York, Akron, Ohio.
National Supply Co., Toledo, Ohio
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
Petroleum Supply Co., Houston, Texas
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Republic Rubber Co., Youngstown, Ohio
Texas Belting Co., Houston, Texas.

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Continental Supply Co., St. Louis, Missouri
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Goodell-Pratt Co., 57 Wells St., Greenfield, Mass.
Kolesch & Co., 138 Fulton St., New York, N. Y.
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National Supply Co., Toledo, Ohio
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
The L. S. Starrett Co., Athol, Mass.

RULES, Slide

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
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Continental Supply Co., St. Louis, Missouri
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
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Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
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United States Blue Print Paper Co., 207 S. Wabash Ave., Chicaog, Ill.

RUNWAYS, Tank Car

NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.

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John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Ft. Worth Steel & Machinery Co., Ft. Worth, Texas.

S

SADDLES, Fire Door Safety

American Abrasive Metals Co., 50 Church St., New York, N. Y.

SADDLES, Manhole

Glasgow Iron Co., Pottstown, Pa.

SADDLES, Pipe

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

SADDLES, Service

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

SAFETY DEVICES, Automatic Refrigerating Machinery

Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.

SAFETY EQUIPMENT

PULMOSAN SAFETY EQUIPMENT CO., 386 Jay St., Brooklyn, N. Y. See Advertisers' Index.

SAFETY GRATINGS, Drainage

American Abrasive Metals Co., 50 Church St., New York, N. Y.

SANITARY EQUIPMENT

Henry Disston & Sons, Inc., Philadelphia, Pa.
D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
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Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.

SCALES

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Richardson Scale Co., Clifton, N. J.

SCALES, Fuel Oil

Fairbanks Co., 416-22 Broome St., New York, N. Y.
Richardson Scale Co., Clifton, N. J.

REMOVERS, Scale

WARD CHEMICAL CO., Tulsa, Okla. See Advertisers' Index.

Wm. B. Pierce Co., 45 N. Division St., Buffalo, N. Y.

SCOOPS

Continental Supply Co., St. Louis, Missouri
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.

SCRAPERS, Bearing

Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

SCRAPERS, Paint

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.

SCREENS, Water, Travelling

D'Olier Centrifugal Pump & Machine Co., 165 Broadway, New York City, N. Y.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

SCREW DRIVERS

Goodell-Pratt Co., 57 Wells St., Greenfield, Mass.

SCREW DRIVERS, Electric

Jas. Clark, Jr., Electric Co., 600 E. Bergman St., Louisville, Ky.
John Steptoe Co., 2960 Colerain Ave, Cincinnati, Ohio

SCREWS, Safety Set

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.

SCRUBBERS

ANDREWS - BRADSHAW CO., 533 Fourth Ave., Pittsburgh, Pa. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
SOUTHWESTERN ENGINEERING CO., Hollingsworth Bldg., Los Angeles, Cal. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Hartwell Iron Works, Houston, Texas
Kansas City Structural Steel Co., Kansas City, Kansas.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
John Mohr & Sons, 96th and Calumet River, Chicago, Ill.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SCRUBBERS, Gas

American Gas Construction Co., Newton, Iowa

SEPARATORS, Air

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.

SEPARATORS, Condensation

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524 - 8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
GRISCOM - RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio...See Advertisers' Index.

A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
Finucane Boiler Works, Houston, Texas.
Illinois Engineering Co., Racine Ave. and 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Lacy Mfg. Co., Washington Bldg., Los Angeles. Calif.
McAlear Mfg. Co., 1901-07 S. Western Ave., Chicago, Ill.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Milwaukee Steam Appliance Co., West Allis, Wis.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tracy Engineering Co., 479-485 Sixth St., San Francisco, Calif.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SEPARATORS, Gasoline

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524 - 8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla...See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Continental Supply Co., St. Louis, Missouri
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Finucane Boiler Works, Houston, Texas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Oil Well Supply Co., Pittsburgh, Pa.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
The Petroleum Iron Works Co., Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tracy Engineering Co., 479-485 Sixth St., San Francisco, Calif.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SEPARATORS, Magnetic

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

SEPARATORS, Oil

DE LAVAL STEAM TURBINE CO. Trenton, N. J. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524 - 8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
GRISCOM - RUSSELL Co., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
POWER PLANT SPECIALTY Co. 440 So. Dearborn St., Chicago, Ill. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SMITH SEPARATOR CO., Tulsa, Okla. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index .
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

American Tank Co., Oklahoma City, Okla.
Arctic Ice Machine Co., Canton, Ohio
Austin-Mason Co., 15 Park Row, New York, N. Y.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
A. W. Cash Co., 3rd and Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Finucane Boiler Works, Houston, Texas.
The Fulton Foundry & Machine Co., E. 75th and Morgan Ave., Cleveland, Ohio.
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.
Illinois Engineering Co., Racine Ave. and 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Linton Machine Co., 101 Park Ave., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Milwaukee Steam Appliance Co., West Allis, Wis.
National Pipe Bending Co., New Haven, Conn.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Oil & Waste Saving Machine Co., 1509 Real Estate Trust Bldg., Philadelphia, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pangborn Corp., Hagerstown, Md.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Plouf Co., 170 Summer St., Boston, Mass.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Tracy Engineering Co., 479-485 Sixth St., San Francisco, Calif.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SEPARATORS, Sludge Acid

Geo. F. Hart Engineering Corp., 52 Vanderbilt Ave., New York, N. Y.

SEPARATORS, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
ANDREWS - BRADSHAW CO., 533 Fourth Ave., Pittsburgh, Pa. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
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POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
POWER PLANT EQUIPMENT CO., 1004 Coca Cola Bldg., Kansas City, Mo. See Advertisers' Index.
POWER PLANT SPECIALTY CO., 440 S. Dearborn St., Chicago, Ill. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. and Township St., Cincinnati, Ohio. See Advertisers' Index.

Austin-Mason Co., 15 Park Row, New York, N. Y.
A. W. Cash Co., 3rd and Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
Eureka Packing Co., 78-80 Murray St., New York, N. Y.
Finucane Boiler Works, Houston, Texas.
Hoppes Mfg. Co., 19 Larch St., Springfield, Ohio.

Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Illinois Engineering Co., Racine Ave. and 21st St., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McAlear Mfg. Co., 1901-17 Southwestern Ave., Chicago, Ill.
Milwaukee Steam Appliance Co., West Allis, Wis.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Oil Well Supply Co., Pittsburgh, Pa.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
James Pappan Mfg. Co., Twentieth & Pike Sts., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Jas. L. Robertson & Son, 79-80 Murray St., New York, N. Y.
John Simmons Co., 104-10 Center St., New York, N. Y.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.
Tracy Engineering Co., 479-485 Sixth St., San Francisco, Calif.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SEPARATORS, Water

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
ELLIOTT CO., Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th and Detroit Sts, Tulsa, Okla. See Advertisers' Index.

Burt Mfg. Co., Akron, Ohio.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Finucane Boiler Works, Houston, Texas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SHAFTING

THE BESSEMER GAS ENGINE CO., Grove City, Pa. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Continental Supply Co., St. Louis, Missouri
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
Hall & Brown Wood Working Machine Co., Broadway, Tyler & Ninth Sts., St. Louis, Mo.
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mesta Machine Co., Pittsburgh, Pa.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Texas Belting Co., Houston, Texas.
Texas Carnegie Steel Assn., Galveston, Texas.
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.
T. B. Wood's Sons Co., Chambersburg, Pa.

SHAPERS

Smith & Mills Co., Cincinnati, Ohio.
John Steptoe Co., 2960 Colerain Ave, Cincinnati, Ohio

SHEAVES

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Boyts, Porter & Co., Connellsville, Pa.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Continental Supply Co., St. Louis, Missouri
DeSoto Foundry & Machinery Co., Mansfield, La.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
Hartwell Iron Works, Houston, Texas
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mesta Machine Co., Pittsburgh, Pa.
Moloch Co., Kaukauna, Wis.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Rogers Foundry & Machine, Joplin, Mo.
Standard Piping & Fittings Co., 30th and Race Sts., Philadelphia, Pa.
Union Engineering Co., Cleveland, Ohio.
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.
T. B. Wood's Sons Co., Chambersburg, Pa.

SHEAVES, Rope

A. & F. Brown Co., 79 Barclay St., New York, N. Y.

SHEAVES, Swing Line

OIL CONSERVATION ENGINEERING CO., Cleveland, O. See Advertisers' Index.

SHELLAC

COOK PAINT & VARNISH CO., North Kansas City, Mo. See Advertisers' Index.

Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio.
Continental Products Co., Euclid, Ohio
Continental Supply Co., St. Louis, Missouri
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
John Lucas Co., Philadelphia, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

SHELVING, Metal

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Berger Mfg. Co., Canton, Ohio
Cleveland Wire Spring Co., Cleveland, Ohio.
Dexter Metal Mfg. Co., 10 So. 18th St., Philadelphia, Pa.
Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Lyon Metallic Mfg. Co., Aurora, Ill.
Fred Medart Mfg. Co., 3535 DeKalb St., St. Louis, Mo.
New York Machinery Co., 200 Fifth Ave., New York, N. Y.
E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Terrell's Equipment Co., Grand Rapids, Mich.
Thomas Pump Works, 154 Spring St., New York, N. Y.
United Alloy Steel Corp., Canton, Ohio.
Yawman & Erbe Mfg. Co., 1099 Jay St., Rochester, N. Y.

SHINGLES, Metallic

Berger Mfg. Co., Canton, Ohio
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
United Alloy Steel Corp., Canton, Ohio.

SHOCK ABSORBERS, Gauge

FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
MERIAM CO., 8405 Detroit Ave., Cleveland, Ohio. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

SHOVELS

The Alcumite Corporation, Dayton, Ohio.
Continental Supply Co., St. Louis, Missouri
R. B. Everett Co., Houston, Texas.
F. W. Gartner Co., Houston, Texas.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

SHREDDERS

Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.

SIEVES, Testing

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.

Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Newark Wire Cloth Co., 351 Verona Ave., Newark, N. Y.
Precision Scientific Co., 820 S. Tripp Ave., Chicago, Ill.

SKYLIGHTS

SOUTHERN CORNICE WORKS, 116 S. Cincinnati, Tulsa, Okla. See Advertisers' Index.

The American Cornice Works Co., 237-41 N. Water St., Wichita, Kansas
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Thorn, J. S. Co., 12th and Allegheny Ave., Philadelphia, Pa.
E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.

SMOKE PREVENTERS

Burke Engineering Co., Holland, Mich.
International Heater Co., 101 Park Ave. Utica, N. Y.
The Kier Fire Brick Co., 1844 Oliver Bldg., Pittsburgh, Pa.
McNamara Brothers Co., Westport, Baltimore, Md.
S. Obermayer Co., 2563 W. 18th St. Chicago, Ill.
Plouff Co., 170 Summer St., Boston, Mass.
Scharf Smoke Preventing Co., Ypsilanti, Michigan.
Steam Boiler Equipment Co., 1750 Monadnock Block, Chicago, Ill.

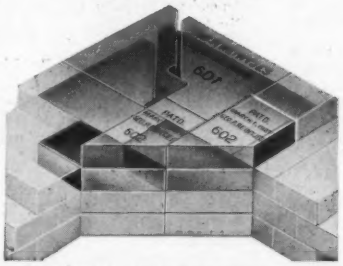
SMOKE STACKS

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
GRAVER CORP., 414 Todd Ave., E. Chicago, Ind. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Chimney Corp., 147 Fourth Ave., New York, N. Y.
American Iron Works, Inc., Louisville, Ky.
American Tank Co., Okla. City, Okla.
Brass Foundry & Machine Co., Fort Wayne, Ind.
The Brownell Co., Dayton, Ohio
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
D. M. Dillon Steam Boiler Works, Beaumont, Texas
John Dollinger, Jr., Inc., Box 423, Fitchburg, Mass.
Dover Boiler Works, 50 Church St., New York, N. Y.
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Frost Mfg. Co., Galesburg, Ill.
A. D. Granger Co., 15 Park Row, New York, N. Y.
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Jas. G. Heggie & Sons, Joliet, Ill.
Hendrick Mfg. Co., Carbondale, Pa.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
International Engineering Works, Inc., Framingham, Mass.
Kansas City Structural Steel Co., Kansas City, Kansas.
E. Keeler Co., Williamsport, Pa.
Kittoe Boiler & Tank Co., Inc., 1307 Bank Pl., S. W., Canton, O.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.

For BOILER SETTINGS and FURNACE BUILDING Write or wire REINTJES' at Kansas City!

REINTJES FURNACE CONSTRUCTIONS

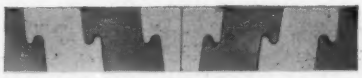


CORNER BONDING TILE

Reintjes Flexible Bonding Tile eliminates the common faults of corner construction and ties both side and end walls together preventing the front wall falling inward. Provides also clearance for expansion at corner. Can also be used in the side walls. Each tile is the thickness of one course of brick and serves as a starting brick. Joints break at each succeeding course and form a perfect corner. The tile overlaps the next lower course thereby protecting the expansion joint. Developed for laying to brick by solid header method or any quarter bond.

Corner-Fill Tile

Reintjes Corner Fill Tile eliminates the soaking heat pocket formed by the square corner and substitutes radiant heat. Eliminates eddying of gases in corner thereby increasing velocity. Reduces friction of gases on side wall thereby increasing the life of linings. Developed for laying in conjunction with bonding tile illustrated above.



Rear Arch Tile

Reintjes Flexible Arch Tile forms its own skewback. No iron or steel required. The units remain level with adjacent brickwork. No temporary arch centers needed. No skewback required.

FOR Reintjes maintains the necessary equipment and organization to take care of urgent demands throughout the country quickly and economically, for any type of still. Expert fire brick setters insure satisfactory installations. During the past several months, one or more installations have been made in eight large refineries.

Possible to salvage old firebrick —on repairs and replacement

Another thing too, Reintjes has the equipment necessary to reclaim used fire brick—a service practically exclusive with the Reintjes organization—and a money saver for the customers.

Direct reference proving the economy and dependability of Reintjes erections—will be given without obligation upon request.

Write Today

GEO. P. REINTJES CO.

2517-19 JEFFERSON ST., KANSAS CITY, MO.

Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
McEwen Bros., Wellsville, N. Y.
McNamara Brothers Co., Westport, Baltimore, Md.
James McNeil & Bro. Co., 29th and A. V. R. R., Pittsburgh, Pa.
Michelmann Steel Construction Co., Cor. of Second & Hampshire Sts., Quincy, Ill.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Moffat Feed Water Heater & Purifier Co., 724 E. Monument Ave., Dayton, Ohio.
John Mohr & Sons, 96th and Calumet River, Chicago, Ill.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
R. S. Newbold & Son Co., Norristown, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
James Pappan Mfg. Co., 20th and Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond and Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Rust Engineering Co., 502 District National Bank Bldg., Washington, D. C.
Scharf Smoke Preventing Co., Ypsilanti, Michigan.
The Stanwood Corp., Cincinnati, O.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
The Union Iron Works, Erie, Pa.
Walsh's Holyoke Steam Boile Works, Holyoke, Mass.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

SOFTENERS, Water

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
PAIGE & JONES CHEMICAL CO., Hammond, Ind. See Advertisers' Index.
POWER PLANT SPECIALTY CO., Houston, Texas.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WARD CHEMICAL COMPANY, 226 Atco Bldg., Tulsa, Okla. See Advertisers' Index.

American Water Softener Co., Lehigh Ave. at Fourth St., Philadelphia, Pa.
Joe Barlow Distributor, Crodus and Taylor, Dallas, Texas
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Dearborn Chemical Co., 310 S. Michigan Ave., Chicago, Ill.
International Filter Co., 335 W. Twenty-Fifth Place, Chicago, Ill.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Lake Erie Mfg. Co., Inc., 192-198 Chicago St., Buffalo, N. Y.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Reiter Co., 259 North St., Elgin, Ill.
Wm. Scaife & Sons Co., Oakmont, Pa.
Sugar Beet Products Co., Saginaw, W. S. Mich.
Thermal Efficiency Co., 1210 Scarritt Bldg., Kansas City, Mo.

SOLDER

The Eagle-Picher Lead Co., 208 S. LaSalle St., Chicago, Ill.

SOLDER, Castings

Plouf Co., 170 Summer St., Boston, Mass.

SOLDERING SUPPLIES

Continental Supply Co., St. Louis, Missouri
Langstadt-Meyer Co., Appleton, Wis.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

SOLENOIDS

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

SPADES

Continental Supply Co., St. Louis, Missouri
F. W. Gartner Co., Houston, Texas.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

SPADERS, Clay, Compressed Air

Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.

SPARK PLUGS

Stitt Ignition, Columbus, Ohio

SPECIALTIES, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St. Cincinnati, Ohio. See Advertisers' Index.

Atlas Valve Co., 282 South St., Newark, N. J.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Lewis Steam Specialty & Valve Co., 5145 Delancey St., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Milwaukee Steam Appliance Co., West Allis, Wis.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stickle Steam Specialties Co., Indianapolis, Ind.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Trane Co., LaCrosse, Wis.
Warren Webster & Co., Camden, N. J.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.

SPECIFIC GRAVITY APPARATUS

THE AC-ME COMPANY, 3408 Main St., Dallas, Texas. See Advertisers' Index.
BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Illinois Glass Co., Alton, Ill.
Taylor Instrument Co., Rochester, N. Y.

SPRAYS, Paint

AMERICAN PAINT & SUPPLY CO., Dallas, Texas. See Advertisers' Index.
DETROIT GRAPHITE CO., Detroit, Mich. See Advertisers' Index.

The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Arco Co., Cleveland, Ohio
Arlington Paint & Varnish Co., 1329 Harrison Ave., S. W. Canton, Ohio.
Binks Spray Equipment Co., 3114 Carroll Ave., Chicago, Ill.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Brunner Mfg. Co., Utica, N. Y.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Continental Products Co., Euclid, Ohio
The DeVilbiss Co., 301 Phillips Ave., Toledo, Ohio.
The Eclipse Paint & Mfg. Co., Cleveland, Ohio.
Hampton Paint & Chemical Co., Springfield, Mass.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
John Lucas Co., Philadelphia, Pa.
MacLeod Company, Cincinnati, Ohio
W. N. Matthews Corp., 3714 Forrest Park Blvd., St. Louis, Mo.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.

SPRAYERS, Refractory

QUIGLEY FURNACE SPECIALTIES CO., 26 Cortlandt St., New York, N. Y. See Advertisers' Index.

SPRINGS

NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.

Cleveland Wire Spring Co., Cleveland, Ohio.
Continental Supply Co., St. Louis, Missouri

SPRINKLERS

A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Globe Automatic Sprinkler Co., 2035 Washington Ave., Philadelphia, Pa.
E. Leonard & Sons, Ltd., York St., London, Canada.
Lewis Steam Specialty & Valve Co., 5145 Delancey St., Philadelphia, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
Thompson Mfg. Co., Los Angeles, Calif.

SPRINKLERS, Automatic

Central Automatic Sprinkler Co., 5145 Delancey St., Philadelphia, Pa.

SPROCKETS

Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Diamond Chain & Mfg. Co., 502 Kentucky Ave., Indianapolis, Ind.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Independent Foundry Co., 73 York St., Portland, Ore.
Jeffrey Mfg. Co., 904-99 No. Fourth St., Columbus, Ohio.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Moloch Co., Kaukauna, Wis.
Morse Chain Co., Ithaca, N. Y.
National Supply Co., Toledo, Ohio
Oil Well Supply Co., Pittsburgh, Pa.

STACKS, Steel

Shevlin Engineering Co., Inc., 259 W. 34th St., New York, N. Y.

STAINS

The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

STAIRS, Steel

E. Van Noorden Co., 100 Magazine St., Roxbury, Mass

STANDS, Operating Floor

The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.

STARTERS, Electric Motor

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
Houston Armature Works, Houston, Texas
Southern Engine & Pump Co., Houston, Texas
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

STEEL, Carbon

Allegheny Steel Co., Pittsburgh, Pa.
Andrews Steel Co., Newport, Ky.
Atlas Steel Corp., Dunkirk, N. Y.
Berger Mfg. Co., Canton, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Central Alloy Steel Corp., Massillon, Ohio.
Columbia Steel Co., 351 California St., San Francisco, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Cyclops Steel Co., Titusville, Pa.
Ellsworth Haning, 114-18 Liberty St., New York, N. Y.
Hobson, Houghton & Co., 83 Beekman St., New York, N. Y.
Inland Steel Co., 38 South Dearborn St., Chicago, Ill.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.

Kansas City Structural Steel Co., Kansas City, Kansas.
Ludlum Steel Co., Watervliet, New York
National Malleable & Steel Castings Co. Cleveland, Ohio.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Vanadium Alloys Steel Co., Latrobe, Pa.

STEEL, Cold Rolled

WESTERN IRON & FOUNDRY CO., Wichita, Kansas. See Advertisers' Index.

Berger Mfg. Co., Canton, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, Ohio.
Crucible Steel Co. of America, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
National Supply Co., Toledo, Ohio
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Texas Belting Co., Houston, Texas.
Texas Carnegie Steel Assn., Galveston, Texas.
Wickwire-Spencer Steel Co., 41 E. Forty-Second St., New York, N. Y.

STEEL EQUIPMENT, Office

Berger Mfg. Co., Canton, Ohio
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Thomas Pump Works, 154 Spring St., New York, N. Y.

STEEL, Fabricated Structural

NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Bergen Point Iron Works, West Fifth St., Bayonne, N. J.
Bethlehem Steel Co., Bethlehem, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hartwell Iron Works, Houston, Texas
Industrial Construction Company, Peoria Road, Tulsa, Okla.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
McDougall & Potter Co., 141st and Rider Ave., New York, N. Y.
Moloch Co., Kaukauna, Wis.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Robinson Ventilating Co., 517 House Bldg., Pittsburgh, Pa.
Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

STEEL, High Speed

Atlas Steel Corp., Dunkirk, N. Y.
Columbian Tool Steel Co., Chicago Heights, Ill.
Vanadium Alloys Steel Co., Latrobe, Pa.

STEEL PLATE, Construction

BIGGS BOILER WORKS CO., Case Ave. and Newton St., Akron, Ohio. See Advertisers' Index.
CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kans. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WESTERN IRON & FOUNDRY CO., Wichita, Kans. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bergen Point Iron Works, West Fifth St., Bayonne, N. J.
Bethlehem Steel Co., Bethlehem, Pa.
Brass Foundry & Machine Co., Fort Wayne, Ind.
Coatesville Boiler Works, Coatsville, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Erie City Iron Works, Erie, Pa.
Finucane Boiler Works, Houston, Texas.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
A. D. Granger Co., 15 Park Row, New York, N. Y.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Jos. Honhorst Co., 1016-20 W. Sixth St., Cincinnati, Ohio.
International Engineering Works, Inc., Framingham, Mass.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
E. Keeler Co., Williamsport, Pa.
Kittoe Boiler & Tank Co., Inc., 1307 Bank Pl., S. W., Canton, O.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Lancaster Iron Works, Inc., 560 So. Prince St., Lancaster, Pa.
Leader Iron Works, Decatur, Ill.
Lebanon Boiler Works, 1246 Buttonwood St., Lebanon, Pa.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McDougall & Potter Co., 141st and Rider Ave., New York, N. Y.
McNamara Brothers Co., Westport, Baltimore, Md.
James McNeil & Bro. Co., 29th & A. V. R. R., Pittsburgh, Pa.
Moffat Feed Water Heater & Purifier Co., 724 E. Monument Ave., Dayton, Ohio.
Moloch Co., Kaukauna, Wis.
John Mohr & Sons, 96th and Calumet River, Chicago, Ill.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Mount Cooper Boiler & Iron Co., Tulsa, Okla.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
R. S. Newbold & Son Co., Norristown, Pa.
New York Engineering Co., 2 Rector St., New York, N. Y.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Quaker City Iron Works, Richmond and Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Standard Tank Car Co., Sharon, Pa.
The Stanwood Corp., Cincinnati, O.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Thorn, J. S., Co., 12th and Allegheny Ave., Philadelphia, Pa.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

STEEL, Reinforcing

Truscon Steel Co., Youngstown, Ohio.

STEEL, Sheet

Allegheny Steel Co., Pittsburgh, Pa.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

STEEL, Stainless or Rustless

Central Alloy Steel Corp., Massillon, Ohio.

STEEL, Structural

GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
NORTH AMERICAN CAR CORP., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WESTERN IRON & FOUNDRY Co., Wichita, Kans. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Columbia Steel Co., 351 California St., San Francisco, Calif.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Eastern Steel Co., Pottsville, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Hartwell Iron Works, Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis Mo.
Industrial Construction Company, Peoria Road, Tulsa, Okla.
Inland Steel Co., 38 South Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Ross St., Pittsburgh, Pa.
Kansas City Structural Steel Co., Kansas City, Kansas.
Luken Steel Co., C. E. Naylor, Houston, Texas.
McDougall & Potter Co., 141st & Rider Ave., New York, N. Y.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., 942 Curry Bldg., Pittsburgh, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Union Boiler Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
Western Gas Construction Co., Fort Wayne, Ind.

STEEL, Tool

WESTERN IRON & FOUNDRY CO., Wichita, Kan. See Advertisers' Index.

Andrews Steel Co., Newport, Ky.
Atlas Steel Corp., Dunkirk, N. Y.
Berger Mfg. Co., Canton, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colburn Gear & Mfg. Co., 98 Holmes St., Norfolk Downs, Mass.
Colonial Steel Co., 324 Fourth Ave., Pittsburgh, Pa.
Columbian Tool Steel Co., Chicago Heights, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Cyclops Steel Co., Titusville, Pa.
Henry Disston & Sons, Inc., Philadelphia, Pa.
Ellsworth Haning, 114-18 Liberty St., New York, N. Y.
Hobson, Houghton & Co., 83 Beekman St., New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Ludlum Steel Co., Watervliet, New York
McInnes Steel Co., Ltd., Corry, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
A. R. Purdy Co., Inc., 790-4 Greenwich St., New York, N. Y.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Texas Carnegie Steel Ass'n., Galveston, Texas.
Vanadium Alloys Steel Co., Latrobe, Pa.

STEELS, Alloy Tool

Vanadium Alloys Steel Co., Latrobe, Pa.

STEMS, Valve

MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
Cyclops Steel Co., Titusville, Pa.
Gulf Coast Machine & Supply Co., Beaumont, Texas.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Moloch Co., Kaukauna, Wis.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Wm. Powell Co., Cincinnati, Ohio
Southern Brass Mfg. Co., Houston, Texas.

STICKS, Packing

Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.

STILLS, Cracking

A. O. SMITH CORP., Milwaukee, Wis. See Advertisers' Index.

STILLS, Oil

Key Boiler & Equipment Co., 27th and McCasland, E. St. Louis, Ill.
National Electric Heating Co., 10 High St., Boston, Mass.

STILLS, Oil Laboratory

C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.

STILLS, Pipe

Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

STILLS, Pressure

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Bethlehem Steel Co., Bethlehem, Pa.
Elaw-Knox Co., Pittsburgh, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
Finucane Boiler Works, Houston, Texas.
Freeman Mfg. Co., Racine, Wis.
Jas. G. Heggie & Sons, Joliet, Ill.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
International Engineering Works, Inc., Framingham, Mass.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Leader Iron Works, Decatur, Ill.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McEwen Bros., Wellsville, N. Y.
McNamara Brothers Co., Westport, Baltimore, Md.
Mount Cooper Boiler & Iron Co., Tulsa, Okla.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelph a Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Rust Engineering Co., 502 District National Bank Bldg., Wash ngton, D. C.
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.
Standard Tank Car Co., Sharon, Pa.
Steel Improvement & Forge Co., Cleveland, Ohio.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
M. H. Treadwell Co. of Ill., 208 S. LaSalle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

STILLS, Steam

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS, CO., Kansas City, Kan. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, Cal. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
Louisville, Ky. See Advertisers' Index.
HENRY VOGT MACHINE CO. Louisville, Ky. See Advertisers' Index.
WINKLER & KOCH, 429 First National Bank, Wichita, Kan. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
Finucane Boiler Works, Houston, Texas.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Freeman Mfg. Co., Racine, Wis.
International Engineering Works, Inc., Framingham, Mass.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
McAleenan Bros. Co., Twenty-fifth and Railroad, Pittsburgh, Pa.
McEwen Bros., Wellsville, N. Y.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
McNamara Brothers Co., Westport, Baltimore, Md.
Mcsher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Rust Engineering Co., 502 District National Bank Bldg., Wash ngton, D. C.
Sowers Mfg. Co., 1294 Niagara St., Buffalo, N. Y.
Standard Tank Car Co., Sharon, Pa.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

STILLS, Tube

POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.
WINKLER & KOCH, 429 First National Bank, Wichita, Kan. See Advertisers' Index.

STILLS, Water

FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.

International Filter Co., 335 W. Twenty-Fifth Place, Chicago, Ill.
Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.

STOCKS, Hand

Standard Engineering Co., Ellwood City, Pa.

STOCKS AND DIES

WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Armstrong Bros. Tool Co., 302 N. Francisco Ave., Chicago, Ill.
Armstrong Mfg. Co., 348 Knowlton, Bridgeport, Conn.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo, O.

STOKERS

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.

American Engineering Co., Philadelphia, Pa.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Budd Grate Co., 2013 E. Letterly St., Philadelphia, Pa.
Burke Engineering Co., Holland, Mich.
Canton Grate Co., 1711 Dillon Place, Canton, Ohio.
Detroit Stoker Co., 340 General Motors Bldg., Detroit, Mich.
Erie City Iron Works, Erie, Pa.
Flynn & Emrich Co., N. E. Cor. Holliday & Saratoga Sts., Baltimore, Md.
Green Engineering Co., E. Chicago, Ind.
M. A. Hofft Co., Indianapolis, Ind.
International Engineering Works, Inc., Framingham, Mass.
Marion Machine, Foundry & Supply Co., Box 685, Marion, Ind.
Moloch Co., Kaukauna, Wis.
Riley Stoker Corp., Worchester, Mass.
Rosedale Foundry & Machine Co., Columbus and Preble Aves., North Side, Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Twin Fire Furnace Co., 1252 First National Bank Bldg., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

STOPS, Limit

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

STOPPERS

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.

Plouff Co., 170 Summer St., Boston, Mass.

STOPPERS, Rubber

La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.

STRAINERS, Air

Self Cleaning Strainer Co., 5125 S. Carpenter St., Chicago, Ill.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.

STRAINERS, Gas

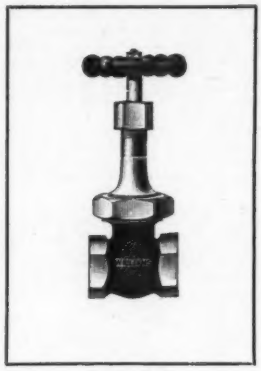
Self Cleaning Strainer Co., 5125 S. Carpenter St., Chicago, Ill.

STRAINERS, Air

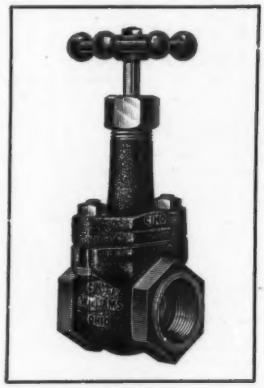
GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

American Liquid Meter Co., 2217 Orange St., Alhambra, Calif.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
MacLeod Company, Cincinnati, Ohio
Mason Regulator Co., Boston, Mass.
Maxon Premix Burner Co., Muncie, Ind.
Morse Dry Dock & Repair Co., Fuel Oil Engineering Dept., Foot 56th St., Brooklyn, N. Y
H. Mueller Mfg. Co., Decatur, Ill.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
Richmond Engineering Co. 935 Brook Ave., Box 514, Richmond, Va.

Protect the Vital Points



No. 127
Bronze Gate Valve
For 200 lbs. pressure.
Sizes ¼" to 3"



No. 300
"Cino" Iron Gate Valve
For 125 lbs. pressure.
Sizes ¼" to 3"

No. 131
Bronze Quick Opening Gate Valve
For 200 lbs. pressure.
Sizes ½" to 4"

At hundreds of points valves are the direct guardians of the bank account, standing between the waste of heat, cold and pressures that means precious fuel lost and the leakage of acids, gases or other materials. Among the smallest of equipment in the power and manufacturing plant and refineries, valves may shut down great boilers, stop machines or processes, hold up production and ruin products—if they fail.

Poor valves are expensive at any price, and good valves are cheap at the highest price.

Williams Valves are the loyal, capable guardians that never fail, never disappoint and are faithful to the service for which each is built.

At thousands of vital points in every kind of industrial plant—on land and sea—Williams Valves are guarding the power, processes and profits of industry.

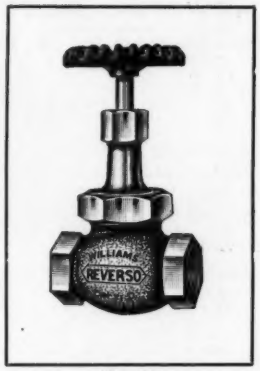
The name "Williams" on a valve is at once a safeguard against accident, a surety of service and the sign of lowest cost per year of use.

"Williams" is the general guarantee of specific valve service for each valve type we make, one of which fully meets each need in most advanced engineering practice.

If you want maximum valve service at minimum expense—specify "WILLIAMS" on your next order. Your dealer can supply you.

The D. T. Williams Valve Co.
Cincinnati, Ohio.

Makers of High Grade Bronze and Iron, Regrinding and Nickel Seat Stop and Check Valves, Gate, Blowoff, Hydraulic, Swing and Ball Check, Needle, Hose, Whistle Valves, Stop and Air Cocks, Unions, Fittings, Water Gauges, Gauge Cocks, Oil Gauges, Lubricators, Oil and Grease Cups, Steam Traps, Separators.



No. 780
"Reverso" Bronze Globe Valve
Reversible Nickel Disc and Seat. For 200 lbs. pressure.
Sizes ½" to 3"

No. 460
"Iroverso" Iron Globe Valve.
Bronze Mounted Reversible Nickel Disc and Seat.
For 150 lbs. pressure.
Sizes ½" to 2"

No. 107
Bronze Regrinding Valve
For 200 lbs. pressure
Size ½" to 3"

Williams Valves

The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Self Cleaning Strainer Co., 5125 S. Carpenter St., Chicago, Ill.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Wickwire-Spencer Steel Co., 41 E. Forty-Second St., New York, N. Y.
G. E. Witt Co., Inc., 862-64 Howard Lehigh Ave., Philadelphia, Pa.

STRAINERS, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
C. H. Wheeler Mfg. Co., 19th St. and Lehigh Ave., Philadelphia, Pa.

STRAINERS, Water

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
ELLIOTT COMPANY Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM-RUSSELL CO., 285 Madison Ave., New York, N. Y. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
American District Steam Co., North Tonawanda, N. Y.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Mason Regulator Co., Boston, Mass.
H. Mueller Mfg. Co., Decatur, Ill.
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
H. A. Paine Co., 419-20 Cotton Exchange Bldg., Houston, Texas.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Refineries Clay Co., 430 Story Bldg., Los Angeles, Calif.
W. S. Rockwell Co., 50 Church St., New York, N. Y.
Rosedale Foundry & Machine Co., Columbus and Preble Aves., North Side, Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Self Cleaning Strainer Co., 5125 S. Carpenter St., Chicago, Ill.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Wickwire-Spencer Steel Co., 41 E. Forty-Second St., New York, N. Y.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

STRIPS, Felt, Dustproofing

Booth Felt Co., Inc., 463-473 Nineteenth St., Brooklyn, N. Y.

STRIPPERS

JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.

STUDS, Metal

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.

National Supply Co., Toledo, Ohio
Penn Metal Co., 675 Concord Ave., Cambridge, Mass.
Treadwell Construction Co., Midland, Pa.

SUPERHEATERS

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
THE CALORIZING CO., P. O. Box 452, Pittsburgh, Pa. See Advertisers' Index.
POWER PLANT EQUIPMENT CO., 1004 Coca Cola Bldg., Kansas City, Mo. See Advertisers' Index.
POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

Automatic Furnace Co., Dayton, Ohio.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
The Badenhausen Corp., 1011 Chestnut St., Philadelphia, Pa.
Cross Engineering Co., 700 Baltimore Ave., Kansas City, Mo.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
National Electric Heating Co., 10 High St., Boston, Mass.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Superheater Co, 17 E. 42nd St., New York City, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Whitlock Coil Pipe Co., Hartford, Conn.

SUPPLIES, Drafting Room

Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

SUPPLIES, Engineering

GOETZE GASKET & PACKING CO., New Brunswick, N. J. See Advertisers' Index.

Edison Packing & Sales Co., 234 State St., Boston, Mass.
Eugene Dietzgen Co., 162-166 W. Monroe St., Chicago, Ill.
Gilson Slide Rule Co., Niles, Mich.
W. & L. E. Gurley, Troy, N. Y.
Keuffel & Esser Co., Hoboken, N. J.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.
F. Weber Co., Inc., 1220 Buttonwood St., Philadelphia, Pa.

SUPPLIES, Welding

U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.

SWING LINE, Equipment

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Kansas City Structural Steel Co., Kansas City, Kansas.

SWITCHES, Flood

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.

SWITCHES, Limit

Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.

SWITCHES, Pressure

THE ELECTRIC CONTROLLER & MFG. CO., 2700 East 79th St., Cleveland, Ohio. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.

Houston Armature Works, Houston, Texas
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Trane Co., LaCrosse, Wis.

SWITCHBOARDS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Carleton Mace Engr. Corp., 10 High St., Boston, Mass.
General Electric Co., Schenectady, New York
Houston Armature Works, Houston, Texas
Langstadt-Meyer Co., Appleton, Wis.

SWITCHBOARDS, Crane

ELECTRIC CONTROLLER & MFG. CO., 2700 E. 79th St., Cleveland, Ohio. See Advertisers' Index.

SYPHONS

Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.

SYPHONS, Steam Jet

THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

Continental Supply Co., St. Louis, Missouri
Monarch Mfg. Works, Emery and S. Westmoreland Sts., Philadelphia, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Penberthy Injector Co., 340 Holden Ave., Detroit, Mich.
Sherwood Mfg. Co., 1702-16 Elmwood Ave., Buffalo, N. Y.

SYSTEMS, Heating & Ventilating

M. C. Carlisle & Co., Inc., 575 Albany St., Boston, Mass.

SYSTEMS, Oiling

Bowen Products Corp'n., Auburn, N. Y.
Burt Mfg. Co., Akron, Ohio.

T

TABLES, Office

Brazelton, Wessendorff & Nelms, Houston, Texas
Durand Steel Locker Co., 33 S. Clark St., Chicago, Ill.
Lyon Metallic Mfg. Co., Aurora, Ill.

TACHOMETERS

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
James G. Biddle, 1211-1213 Arch St., Philadelphia, Pa.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Electric Tachometer Corp., 310 N. Eleventh St., Philadelphia, Pa.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York, N.Y.
Precision Thermometer & Instrument Co, 1434-38 Brandywine St., Philadelphia, Pa.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TANK CARS

CONLEY TANK CAR CO., 747 Oliver Bldg., Pittsburgh, Pa. See Advertisers' Index.
GENERAL AMERICAN TANK CAR CORP., 940 Illinois Mercantile Bank Bldg., Chicago, Ill. See Advertisers' Index.
NORTH AMERICAN CAR CO., 416 Hibernia Bank Bldg., New Orleans, La. See Advertisers' Index.
NORTH AMERICAN CAR Co., 327 S. La Salle St., Chicago, Ill. See Advertisers' Index.
OAKITE PRODUCTS, INC., 22 Thames St., New York, N. Y. See Advertisers' Index.

The Acme Tank Car Co., Coffeyville, Kansas
American Car and Foundry Co., 165 Broadway, New York, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Car Co., Chicago, Ill.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Pennsylvania Car Co., Sharon, Pa.
Petroleum Iron Works, Sharon, Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Standard Tank Car Co., Sharon, Pa.

TANK CARS, Insulated

CONLEY TANK CAR CO., 747 Oliver Bldg., Pittsburgh, Pa. See Advertisers' Index.
GENERAL AMERICAN TANK CAR CORP., 940 Illinois Mercantile Bank Bldg., Chicago, Ill. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.

Chicago Steel Car Co., Chicago, Ill.
Pennsylvania Car Co., Sharon, Pa.
Standard Tank Car Co., Sharon, Pa.

TANK CARS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

TANK CONNECTIONS, Lead Lined

United Lead Co., 111 Broadway, New York, N. Y.

TANKS, Accumulator

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill. SeeAdvertisers' Index.

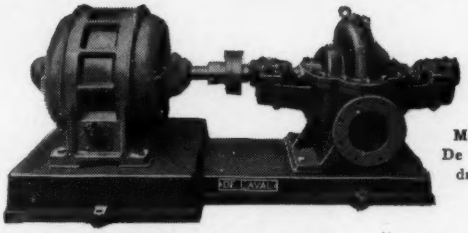
SIX BULLETINS ON TOPICS OF VITAL INTEREST TO REFINERS

MAILED UPON REQUEST

THE CALORIZING COMPANY
PITTSBURGH, PENNA.

Manufacturers of Heat Enduring and Corrosion Resisting Materials

De Laval



Medium size De Laval motor driven pump

CENTRIFUGAL PUMPS

All Liquids in All Quantities and Against All Heads—Belt, Motor or Steam Turbine Drive

De Laval Centrifugal Pumps are especially designed for reliability and durability, being made from the highest class materials and manufactured on a limit gage interchangeable basis, so that renewal parts ordered from the factory by number can be inserted by unskilled men without having to be fitted. These pumps are used for oils and gasoline as well as water.

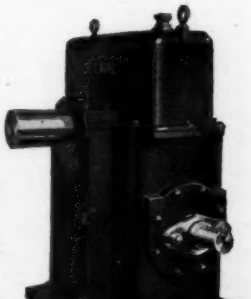
De Laval velocity stage turbine directly connected to De Laval multistage series pump.

De Laval Turbine Driven Pumps

Make large savings in steam consumption over reciprocating pumps. Every De Laval pump is fully guaranteed as to efficiency and head delivery characteristic, and is thoroughly tested before leaving the works. Describe your pumping problems and requirements, so that our engineers can submit recommendations. Ask for Catalog B-116.

The De Laval Worm Reduction Gear

for individual motor drives of slow and moderate speed machinery, is silent, self-contained, compact, self-oiling, efficient and requires practically no attention further than to see that the oil well is kept filled. It is built in single reductions for ratios up to 100 to 1 and in double reductions up to 8000 to 1. Right or left hand and vertical shaft drives are supplied. Ask for Catalog R-116.



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Hartwell Iron Works, Houston, Texas
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New York Engineering Co., 2 Rector St., New York, N. Y.
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James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Quaker City Iron Works, Richmond and Tioga Sts., Philadelphia, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Samuel Smith & Son Co., Paterson, N. J.
Standard Steel Works, Kansas City, Mo.
Standard Tank Car Co., Sharon, Pa.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

TANKS, Storage

CHICAGO BRIDGE & IRON WORKS, 37 Van Buren St., Chicago, Ill., See Advertisers' Index.
GRAVER CORPORATION, 414 Todd Ave., East Chicago, Ind. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS, CO., Kansas City, Kan. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
OAKITE PRODUCTS, INC., 2: Thames St., New York, N. Y. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo.
WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
American Iron Works, Inc., Louisville, Ky.
American Tank Co., Okla. City, Okla.
Armstrong Machinery Co., 3201-19 E. Riverside, Spokane, Wash.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bass Foundry & Machine Co., Fort Wayne, Ind.
Black, Sivalls & Bryson, Bartlesville, Okla.
The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.
Braun-Knocht Heimann Co., 57: Mission St., San Francisco, Cal.
Bridgeport Boiler Works Co., Bridgeport, Conn.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Chicago Steel Car Co., Chicago, Ill.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Continental Supply Co., St. Louis, Missouri
Connery & Co., Inc., Second and Luzerne Sts., Philadelphia, Pa.
The Cullen Co., Clinton, Iowa
Curtis & Minck, Inc., 53 Park Place, New York, N. Y.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Dover Boiler Works, 50 Church St., New York, N. Y.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Erie City Iron Works, Erie, Pa.
Fort Worth Steel & Machinery Co., Fort Worth, Texas
Freeman Mfg. Co., Racine, Wis.
Gilbert & Barker Mfg. Co., Springfield, Mass.
Hartwell Iron Works, Houston, Texas
Jas. G. Heggie & Sons, Joliet, Ill.
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
Herbert Boiler Co., Root and La-Salle Sts., Chicago, Ill.
Hodge Boiler Works, 99 Sumner St., East Boston, Mass.
International Engineering Works, Inc., Framingham, Mass.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jewell Polar Co., 9 S. Clinton St., Chicago, Ill.
Kansas City Structural Steel Co., Kansas City, Kansas.
Kewanee Boiler Co., Kewanee, Ill.
Kittoe Boiler & Tank Co., Inc., 1307 Bank Pl., S. W., Canton, O.
L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N.J.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
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E. Leonard & Sons, Ltd., York St., London, Canada.

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Strongest, safest, greatest visibility, Made for 1", 1½" and 2" connections.

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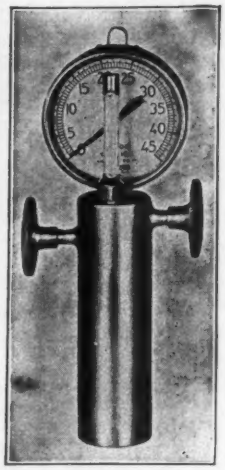

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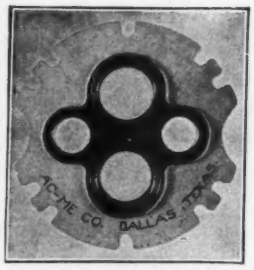

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Quick direct results easily read.
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The standard instrument for determining specific gravity. Accurate, portable, rugged, trouble-proof.
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THE AC-ME COMPANY

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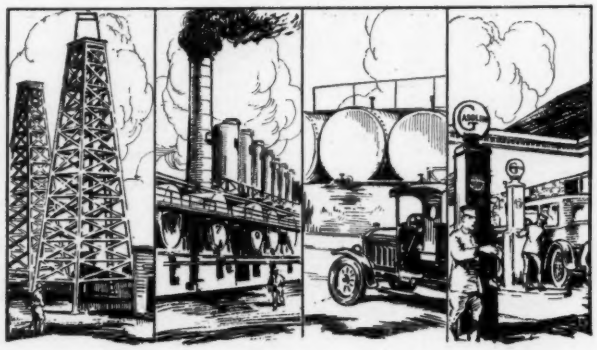

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from your cleaning operations

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It is SAFER and more ECONOMICAL to clean with OAKITE materials and methods. SAFE—because OAKITE is non-inflammable, non-combustible, non-explosive. Eliminates entirely the fire hazard from cleaning. ECONOMICAL—because OAKITE materials thoroughly emulsify mineral oils. And OAKITE methods are effective.

For use in the cleaning of

Storage Tanks	Drums	Salvage parts
Tank cars	Barrels	Filter cloths
Tank steamers	Cans	Pipe Fittings
Motor trucks	Test bottles	Tools

Our special booklet "OAKITE IN OIL INDUSTRY" gives full inormation. Write for a copy. No obligation.

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Oakite Service Men, cleaning specialists, are located at

Albany, Allentown, Pa., Altoona, Pa., *Atlanta, Ga., Baltimore, Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, Buffalo, Camden, Charlotte, N. C., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, *Denver, *Des Moines, *Detroit Erie, Pa., Flint, Mich., Fresno, Cal., *Grand Rapids, Harrisburg, Hartford, *Indianapolis, *Jacksonville, Fla., *Kansas City, *Los Angeles, California; Louisville, Kentucky, *Memphis, Tenn., *Milwaukee, *Minneapolis, *Montreal Newark, Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., *Omaha, Neb., *Philadelphia, *Pittsburgh, Portland, Me., *Portland, Ore., Providence, Reading, *Rochester, Rockford, Rock Island, *San Francisco, *Seattle, *St Louis, South Bend, Ind., Springfield, Ill., Syracuse, *Toledo, *Toronto, *Tulsa, Okla., Utica, *Vancouver, B. C., Williamsport, Pa., Worcester.

*Stocks of Oakite materials are carried in these cities.

OAKITE

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McNamara Brothers Co., Westport, Baltimore, Md.
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Milwaukee Boiler Mfg. Co., 35th St. and National Ave., Milwaukee, Wis.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Moncrief Lenoir Mfg., Co., Houston, Texas
John Mohr & Sons, 96th and Calumet River, Chicago, Ill.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
Mount Cooper Boiler & Iron Co., Tulsa, Okla.
Muskegon Boiler Works, 1204-1208 Eighth St., Muskegon, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
New York Engineering Co., 2 Rector St., New York, N. Y.
R. S. Newbold & Son Co., Norristown, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil City Boiler Works, Inc., Oil City, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Oswego Boiler & Engine Co., Oswego, N. Y.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Pittsburgh-Des Moines Steel Co., 942 Curry Bldg., Pittsburgh, Pa.
Prospect Boiler Co., Ward St. and Raritan River R. R., New Brunswick, N. J.
Quaker City Iron Works, Richmond and Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Riverside Boiler Works, Inc., 50 Harvard St., Cambridge. Mass.
Wm. Scaife & Sons Co., Oakmont, Pa.
Sims Co., Erie, Pa.
John Simmons Co., 104-10 Center St., New York, N. Y.
Sistersville Tank & Boiler Works, Sistersville, West Va.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Standard Steel Works, Kansas City, Mo.
Standard Tank Car Co., Sharon, Pa.
Steel Tank & Products Corp., 26 N. Jefferson St., Chicago. Ill.
Superior Machine & Boiler Works, 840 W. Superior, Chicago, Ill.
Thomas Pump Works, 154 Spring St., New York. N. Y.
M. H. Treadwell Co. of Ill., 208 S. La Salle St., Chicago, Ill.
Treadwell Construction Co., Midland, Pa.
Turner Oil Filter Co., Niles. Mich.
Union Boiler & Mfg. Co., Fourth St. and P. & R., Lebanon, Pa.
Walsh's Holyoke Steam Boiler Works, Holyoke. Mass.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
Geo. A. Weld & Co., 80 Federal St., Boston. Mass.
Western Gas Construction Co., Fort Wayne, Ind.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

TANKS, Tile Storage

The Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill.

TANKS, Truck

Quaker City Iron Works, Richmond & Tioga Sts., Philadelphia, Pa.

TANKS, Welded

Black, Sivalls & Bryson, Bartlesville, Okla.

TAPES, Measuring

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS BROWN & EARLE, 918 Chestnut St., Philadelphia, Pa. See Advertisers' Index.

Abbott-McKay Corp., 21 Pearl St., Boston, Mass.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Eugene Dietzgen Co., 162-100 W Monroe St., Chicago, Ill.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton St., New York, N. Y.
E. Leonard & Sons, Ltd., York St., London, Canada.
The Lufkin Rule Company, Saginaw, Michigan.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
The C. F. Pease Co., 866 N. Franklin St., Chicago, Ill.
Quaker City Iron Works, Richmond and Tioga Sts., Philadelphia, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis. Mo.
E. G. Soltmann, Inc., 202 E. 42nd St., New York, N. Y.
The L. S. Starrett Co., Athol, Mass.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago, Ill.

TAPS

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WALWORTH CO., 88 Pearl St., Boston, Mass. See Advertisers' Index.

Greenfield Tap & Die Corp'n., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Murchey Machine & Tool Co., 950 Porter St., Detroit, Michigan.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia. Pa.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis. Mo.
John Simmons Co., 104-10 Center St., New York, N. Y.

TAPS, Collapsible

Landis Machine Co., Inc., Waynesboro, Pa.

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BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Illinois Glass Co., Alton, Ill.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.

TESTERS, Safety Valve

GENERAL AMERICAN TANK CAR CORP., 940 Illinois Merc. Bank Bldg., Chicago, Ill. See Advertisers' Index.

THERMO-COMPRESSORS

SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

THERMO-COUPLES

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Hoskins Mfg. Co., 4437 Lawton Ave., Detroit, Mich.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Price Mfg. Co., 12369 Euclid Ave., Cleveland, Ohio.
Pyrolectric Instrument Co., Easton, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Wilson Maeulen Co., 383 Concord Ave., New York, N. Y.

THERMOGRAPHS

BROWN INSTRUMENT CO., 4537 Wayne Ave, Philadelphia, Pa. See Advertisers' Index.
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THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Ernest H. DuVivier, 30 Church St., New York, N. Y.
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Kolesch & Co., 138 Fulton St., New York, N. Y.
Palo Company, 153 W. 23rd St., New York, N. Y.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
Taylor Instrument Co., Rochester, N. Y.

THERMOMETERS

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
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BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FAICHNEY INSTRUMENT CORP., Watertown, N. Y. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
THE FOXBORO CO., INC., Neponset Ave., Foxboro, Mass. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WILLIAMS, BROWN & EARLE, 918 Chestnut St., Philadelphia, Po. See Advertisers' Index.

A. S. Aloe Co., 1819 Olive St., St. Louis, Mo.
American Schaeffer & Bundenberg Corp., Berry & S. 5th Sts., Brooklyn, N. Y.
Anthony Company, 138 West Ave., Long Island City, N. Y.
James Berg Mfg. Co., 3707 12th Ave., Brooklyn, N. Y.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carbondale Machine Co., Carbondale, Pa.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
Julien P. Friez & Sons, Baltimore St. & Central Ave., Baltimore, Md.
Gray Instrument Co., 64-70 W. Johnson St., Philadelphia, Pa.
Henry J. Green, 1191 Bedford Ave., Brooklyn, N. Y.
Griebel Instrument Co., Carbondale, Pa.
Humbolt Mfg. Co., 2014 Nebraska Ave., Chicago, Ill.
Illinois Testing Laboratories, Inc., 141-143 W. Austin Ave., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Kolesch & Co., 138 Fulton St., New York, N. Y.
The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Moto-Meter Co., Inc., 15 Wilbur Ave., Long Island City, N. Y.
The Palmer Co., 26 Clay St., St. Bernard Sta., Cincinnati, Ohio.
Palo Company, 153 W. 23rd St., New York, N. Y.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Thermometer Co., 65 Shirley St., Boston, Mass.
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C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.
A. Zaubitz, 95-97 Cliff St., New York, N. Y.

THERMOSTATS

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
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BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa. See Advertisers' Index.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

American Schaeffer & Bundenberg Corp., Berry & S. 5th Sts., Brooklyn, N. Y.
American Thermostat Co., 226 Jeliff Ave., Newark, N. J.
Atlas Valve Co., 282 South St., Newark, N. J.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Carrier Engineering Corp., 750 Frelinghuysen Ave., Newark, N. J.
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The standard for comparison in high temperature cements. It sets at normal temperatures and retains its strength up to temperatures at which the best fire brick loses strength and becomes soft.

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89% Brick,
11% Fire Clay Joint

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97% Brick,
3% Hytempite Joint

Used for furnace and boiler settings and repairs; for setting tile, retorts, oil stills, lining metal melting furnaces, pit furnaces, foundry cupolas and ladles and for patching hot furnaces.

400 pounds of Hytempite will lay 1000 brick—this factor should be considered in figuring cost of fire brick work.

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Re-surface Old Walls
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Surface New Walls

And in many cases you can make repairs while the furnace is hot.

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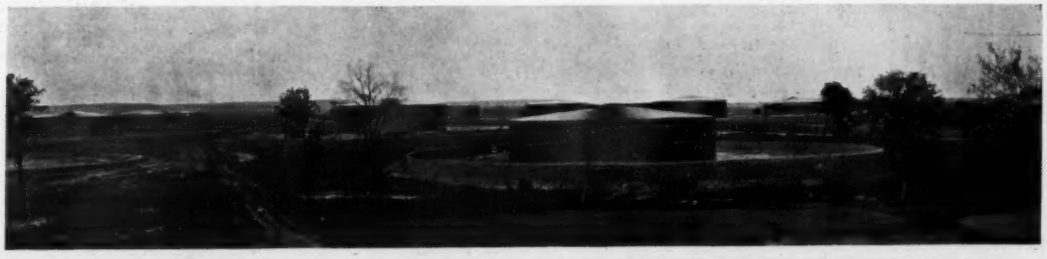
TRIPLE-A Solutions are now protecting Oil Tanks, Pipe Lines, plant equipment and machinery in the oil fields and refineries of this country.



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Griebel Instrument Co., Carbondale, Pa.
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Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
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Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Precision Thermometer & Instrument Co., 1434-38 Brandywine St., Philadelphia, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Carl H. Wagner, 1944 W. Albany Ave., Chicago, Ill.

THIEVES, Oil

BURRELL TECHNICAL SUPPLY CO., INC., 1702 Fifth Ave., Pittsburgh, Pa.
FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.
NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.

Braun-Knecht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Griebel Instrument Co., Carbondale, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.

THREADERS, Bolt

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

THREADERS, Casing

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

THREADERS, Conduit

Oster Mfg. Co., 2057 E. Sixty-First Place, Cleveland, Ohio

THREADERS, Pipe

Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo, O.

THREADERS, Ratchet Pipe

Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo, O.

TILE, Anti-Slip

American Abrasive Metals Co., 50 Church St., New York, N. Y.

TILE, Boiler

BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y.
QUIGLEY FURNACE SPECIALTIES CO., 25 Church St., New York, N. Y.

Burke Engineering Co., Holland, Mich.
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
W. S. Dickey Clay Mfg. Co., Texarkana, Texas
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
James Gardner, Jr., Co., Ebensburg, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
McLeod & Henry Co., Troy, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quinn & Co., 1347 Harrison Ave., Cincinnati, Ohio
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
Walsh Fire Clay Products Co., 4073 N. Main St., St. Louis, Mo.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

TILE, Fire Clay

Acme Brick Co., Ft. Worth, Texas
Chicago Retort & Fire Brick Co., 208 S. La Salle St., Chicago, Ill.
The Denver Fire Clay Co., P. O. Box 1107 Denver, Colorado
W. S. Dickey Clay Mfg. Co., Texarkana, Texas
Eclipse Fuel Engineering Co., Rockford, Ill.
Eureka Fire Brick Works, 1507 First Nat. Bank Bldg., Pittsburgh, Pa.
Evens & Howard Fire Brick Co., 920 Market St., St. Louis, Mo.
James Gardner, Jr., Co., Ebensburg, Pa.
A. P. Green Fire Brick Co., Mexico, Mo.
T. K. Harris, Polytechnic Station, Fort Worth, Texas.
McLeod & Henry Co., Troy, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Standard Fuel Engr'g Co., 667-687 Post Ave., So. Detroit, Mich.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
Walsh Fire Clay Products Co., 4073 N. Main St., St. Louis, Mo.
O. C. Woolson's Son, 39 Cortlandt St., New York, N. Y.

TIN

The Eagle-Picher Lead Co., 208 S. LaSalle St., Chicago, Ill.

TONGS, Pipe

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

TONGS, Rivet

National Supply Co., Toledo, Ohio
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

TOOLS, Beading

A. L. HENDERER'S SONS, Maryland Ave. and Beech St., Wilmington, Delaware. See Advertisers' Index.

TOOLS, Concrete Cutting

Rivet Cutting Gun Co., 125 E. 3rd St., Cincinnati, Ohio.
Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill.

TOOLS, Flaring

A. L. HENDERER'S SONS, Maryland Ave. and Beech St., Wilmington, Delaware. See Advertisers' Index.

TOOLS, Machine

Jas. Clark, Jr., Electric Co., 600 E. Bergman St., Louisville, Ky.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Espen-Lucas Machine Works, Front St. and Girard Ave., Philadelphia, Pa.
Gallmeyer & Livingston Co., 300 Straight Ave., S. W. Grand Rapids, Mich.
Greenfield Tap & Die Corp'n., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
The Lufkin Rule Company, Saginaw, Michigan.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Morris Machine Tool Co., Cincinnati, Ohio
National Supply Co., Toledo, Ohio
Reed-Prentice Co., Worcester, Mass.
E. J. Rooksby & Co., 1097 Hamilton St., Philadelphia, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Steel Products Engineering Co., Springfield, Ohio.
John Steptoe Co., 2060 Colerain Ave, Cincinnati, Ohio

TOOLS, Pipe Line Construction

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.

TOOLS, Planing

Armstrong Bros. Tool Co., 302 N. Francisco Ave., Chicago, Ill.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.

TOOLS, Pneumatic

Canton Pneumatic Co., Canton Ohio.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
Dayton Pneumatic Tool Co., 408 Ray St., Dayton, Ohio.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Wm. H. Keller, Inc., Grand Haven, Mich.
Rivet Cutting Gun Co., 125 E. 3rd St., Cincinnati, Ohio.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Tennant Co., Union National Bank Bldg., Houston, Texas.

TOOLS AND ACCESSORIES, Pneumatic

King Pneumatic Tool Co., 1733 Armitage Ave., Chicago, Ill.

TOOL POST, Portable, Electric

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.

TOOLS, Rivet Cutting

Rivet Cutting Gun Co., 116 E. 3rd St., Cincinnati, Ohio.

TOOLS, Scaling

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.

TOOLS, Slag Digging

Rivet Cutting Gun Co., 116 E. 3rd St., Cincinnati, Ohio.

TOOLS, Special Machinery

METALS COATING COMPANY OF AMERICA, 495-97 N. Third St., Philadelphia, Pa. See Advertisers' Index.

Paragon Machine Co., 77 South Ave., Rochester, N. Y.

TOOLS, Valve Reseating

M. B. Skinner Co., 562 Washington Blvd., Chicago, Ill.

TORCHES, Blow

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
Thos. H. Dallett Co., 165-89 W. Clearfield St., Philadelphia, Pa.
Hauck Mfg. Co., 127 Tenth St., Brooklyn, N. Y.
MacLeod Company, Cincinnati, Ohio
Magnolia Gas Products, Houston, Texas.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
National Supply Co., Toledo, Ohio
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

TORCHES, Cutting

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
The Alexander Milburn Co., 1416 W. Baltimore St., Baltimore, Md.
Brazelton, Wessendorff & Nelms, Houston, Texas.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Carbic Mfg. Co., Duluth, Minn.
Columbian Steel Tank Co., 1401-1631 W. Twelfth St., Kansas City, Mo.
Henderson-Willis Welding & Cutting Co., 2305-09 N. Eleventh St., St. Louis, Mo.
MacLeod Company, Cincinnati, Ohio
Magnolia Gas Products, Houston, Texas.
National Oxygen Co., 5811 W. 66th St., Chicago, Ill.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.
Smiths Inventions, Inc., 2636 Fourth St., S.E., Minneapolis, Minn.
Torchweld Equipment Co., 224 No. Carpenter St., Chicago, Ill.

TOWERS, Absorber

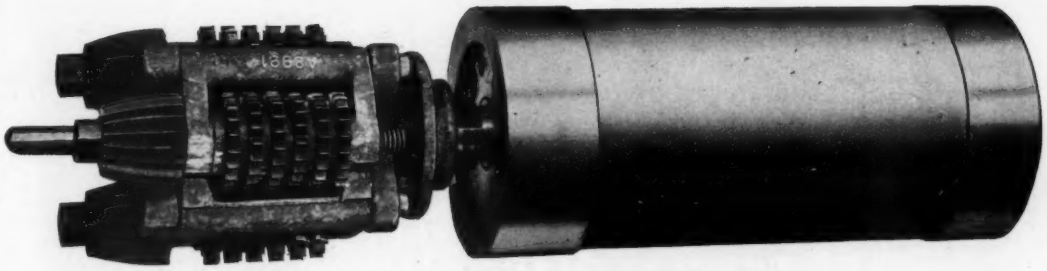
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Leader Iron Works, Decatur, Ill.

TOWERS, Bubble

E. B. BADGER & SONS CO., 62-75 Pitts St., Boston, Mass. See Advertisers' Index.
BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, California. See Advertisers' Index
POWER PIPING CO., 833 Beaver Ave., N. S., Pittsburgh, Pa. See Advertisers' Index.
POWER SPECIALTY CO., 111 Broadway, New York, N. Y. See Advertisers' Index.
STRUTHERS-WELLS CO., Warren, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
THE WINKLER-KOCH ENGINEERING CO., 429 First Natl. Bank Bldg., Wichita, Kansas. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
Erie City Iron Works, Erie, Pa.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co., Washington Bldg., Los Angeles, Calif.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

ROTO TUBE CLEANERS



Roto Air-Driven Heavy Duty Cleaner
For

CRACKING STILLS

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Careful Service—
Prompt Delivery—

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Twelve years of manufacturing experience.

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CENTRAL OFFICES—BARTLESVILLE, OKLA.
A subsidiary of Empire Gas & Fuel Company

LET'S GET ACQUAINTED

TOWERS, Cascade

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erie City Iron Works, Erie, Pa.
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

TOWERS, Cooling

C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
THE COOLING TOWER CO., INC., 15 John Street, New York, N. Y. See Advertisers' Index.
FLUOR CONSTRUCTION CO., 909 East 59th St., Los Angeles, Calif. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers' Index.
NEWTON PROCESS MFG. CO., Fullerton, California. See Advertisers' Index.
POWER PLANT EQUIPMENT CO., 1004 Coca Cola Bldg., Kansas City, Mo. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.

Bergen Point Iron Works, West Fifth St., Bayonne, N. J.
Edwin Burhorn Co., 25 West Broadway, New York, N. Y.
Erie City Iron Works, Erie, Pa.
Franklin B. Hart, Jr., Co., 15 Park Row, New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
Mosher Steel and Machinery Co., 900 S. Austin St., Dallas, Texas
James Pappan Mfg. Co., Twentieth and Pike Sts., Pittsburgh, Pa.
Pennsylvania Furnace & Iron Co., 316 Pine St., Warren, Pa.
Pittsburgh Cooling Tower Co., 401 Bowman Bldg., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
The Youngstown Boiler & Tank Co., Youngstown, Ohio

TOWERS, Spray

Pittsburgh Cooling Tower Co., 401 Bowman Bldg., Pittsburgh, Pa.

TOWERS, Vaporizing

BONER & SHELDON 514 Merchants Natl. Bank Bldg., Los Angeles, Calif. See Advertisers' Index.
C. F. BRAUN & CO., Alhambra, Cal. See Advertisers' Index.
HAMMOND IRON WORKS, P. O. Box 788, Warren, Pa. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Kansas. See Advertisers Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

J. P. Devine Co., 1380 Clinton, Buffalo, N. Y.
Erie City Iron Works, Erie, Pa.
Dean E. Foster, New Wright Bldg., Tulsa, Okla.
Kansas City Structural Steel Co., Kansas City, Kansas.
Lacy Mfg. Co. Washington Bldg., Los Angeles, Calif.
Arthur G. McKee & Co., 2422 Euclid Ave., Cleveland, Ohio
Petroleum Iron Works, Sharon, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
The Widdell Engineering Co., 512 American Bk. Bldg., Kansas City, Mo.

TRANSFORMERS, Electrical

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Burke Electric Co., Erie, Pa.
The Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.
General Electric Co., Schenectady, New York
Houston Armature Works, Houston, Texas
Langstadt-Meyer Co., Appleton, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TRANSFORMERS, Speed

A. & F. Brown Co., 79 Barclay St., New York, N. Y.
The Hill Clutch Machine & Foundry Co., Cleveland, Ohio
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Utility Mfg. Co., Cudahy, Wis.

TRANSMISSION EQUIPMENT

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
A. & F. Brown Co., 79 Barclay St., New York, N. Y.
Diamond Chain & Mfg. Co., 502 Kentucky Ave., Indianapolis, Ind.
Diamond Rubber Co., Inc., Akron, Ohio.
R. & J. Dick Co., Inc., Passaic, N. J.
Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio.
The Hill Clutch Machine & Foundry Co., N.E. Cor. Breakwater Ave. and W. 65th St., Cleveland, Ohio.
Jones, W. A., Foundry & Machine Co., 4415 W. Roosevelt Road, Chicago, Illinois
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill
Moloch Co., Kaukauna, Wis.
Republic Rubber Co., Youngstown, Ohio
W. T. Shackley & Son, 523 Atlantic Ave., Boston, Mass.
Texas Belting Co., Houston, Texas.
Weller Mfg. Co., 1820 N. Kostnor Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
I. B. Williams & Sons, 9 Orchard St., Dover, N. H.
T. B. Wood's Sons Co., Chambersburg, Pa.

TRAPS, Air

GEO. B. ALLAN & CO., Simpson Bldg., Dallas Texas. See Advertisers' Index.

V. D. Anderson Co., 1953 W. Ninety-Sixth St., Cleveland, O.

TRAPS, Gasoline

GEO. B. ALLAN & CO., Simpson Bldg., Dallas. Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.

TRAPS, Oil

Armstrong Machine Works, Three Rivers, Mich.

TRAPS, Return

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

TRAPS, Steam

GEO. B. ALLAN & CO., Simpson Bldg., Dallas. Texas. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
JOHNS-MANVILLE, INC., 292 Madison Ave., New York, N. Y. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. and Township St., Cincinnati, Ohio. See Advertisers' Index.

Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
The American Blower Co., 6004 Russell, Detroit, Mich.
American Schaeffer & Bundenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
V. D. Anderson Co., 1953 W. Ninety-Sixth St., Cleveland, O.
Armstrong Machine Works, Three Rivers, Mich.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
F. A. Burrows Mfg. Co., 41-45 N. Water St., York, Pa.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
W. H. Curtin & Co., 419 Washington Ave., Houston, Texas.
Equitable Equipment Co., Inc., New Orleans, La.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Foskett & Bishop Co., New Haven, Conn.
The Fulton Foundry & Machine Co., E. 75th and Morgan Ave., Cleveland, Ohio.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Paul B. Huyette Co., Inc., 5 South Eighteenth St., Philadelphia, Pa.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Jenkins Bros., 80 White St., New York, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kitts Mfg Co., Oswego, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem, Mass.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Milwaukee Steam Appliance Co., West Allis, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.
Nitingale & Childs Co., 195 Albany St., Cambridge Sta., Boston, Mass.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Peabody Engineering Corp., 110 E. Forty Second St., New York, N. Y.
Perolin Co. of America, 2010 People's Gas Bldg., Chicago, Ill.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
C. E. Squires Co., E. Fortieth St. & Kelley Ave., Cleveland, Ohio.
Sterling Engineering Co., 1636 Holton St., Milwaukee, Wis.
Stickle Steam Specialties Co., Indianapolis, Ind.
The Swartwout Co., 18525 Euclid Ave., Cleveland, Ohio.
Sweet & Doyle Foundry & Machine Co., Green Island, Troy, N. Y.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Trane Co., LaCrosse, Wis.
Volz Engineering Equipment Co., 502 E. 3rd St., Los Angeles, Cal.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
Wright Austin Co., 315 W. Woodbridge, Detroit, Mich.

TRAPS, Steam, High Pressure

Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.

TRAPS, Vacuum

SARCO CO., INC., 183 Madison Ave., New York, N. Y. See Advertisers' Index.

Armstrong Machine Works, Three Rivers, Mich.

TREADS, Anti-Slip

American Abrasive Metals Co., 50 Church St., New York, N. Y.

TROUGHS AND CONVEYORS, Filter Press

Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Union Engineering Co., Cleveland, Ohio.

TRUCKS

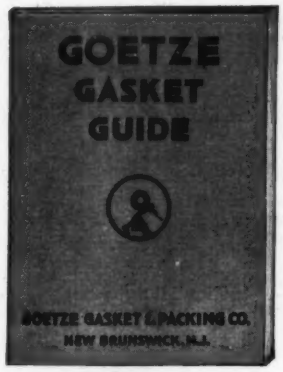
The Lakewood Engineering Co., Cleveland, Ohio

TUBES, Boiler

THE CALORIZING CO., Wilkinsburg, Pa. See Advertisers' Index.
BABCOCK & WILCOX CO., 85 Liberty St., New York, N. Y. See Advertisers' Index.
THE KAW BOILER WORKS CO., Kansas City, Mo. See Advertisers' Index.
PITTSBURGH STEEL PRODUCTS CO., Union Arcade Bldg., Pittsburgh, Pa. See Advertisers' Index.
TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Allegheny Steel Co., Pittsburgh, Pa.
American Iron Works, Inc., Louisville, Ky.
American Rolling Mill Co., Middletown, Ohio
American Tube & Pipe Bending Co., Niles, Ohio
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Berger Mfg. Co., Canton, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
The Brownell Co., Dayton, Ohio.
Casey-Hodges Mfg. Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Box 316, Chattanooga, Tenn.
Continental Supply Co., St. Louis, Missouri
The Cullen Co., Clinton, Iowa
D. M. Dillon Steam Boiler Works, Fitchburg, Mass.
John Dollinger, Jr., Inc., Box 423, Beaumont, Texas
T. F. Downey Boiler Works, 2600-10 W. Grand Ave., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erie City Iron Works, Erie, Pa.
Freeman Mfg. Co., Racine, Wis.
Globe Steel Tubes Co., 1345 Burnham St., Milwaukee, Wis.
Harrisburg Pipe & Pipe Bending Co., Houston, Texas
Heine Boiler Co., 5319 Marcus Ave. St. Louis, Mo.
International Engineering Works, Inc., Framingham, Mass.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Kansas City Structural Steel Co., Kansas City, Kansas.
E. Leonard & Sons, Ltd., York St., London, Canada.
A. M. Lockett & Co., Ltd., Queen & Crescent Bldg., New Orleans, La.
Milwaukee Boiler Mfg. Co., 35th St. and National Ave., Milwaukee, Wis.
Monangahela Tube Co., Pittsburgh, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio

GOETZE



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Modern Refinery Practice

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Goetze Gasket & Packing Co.

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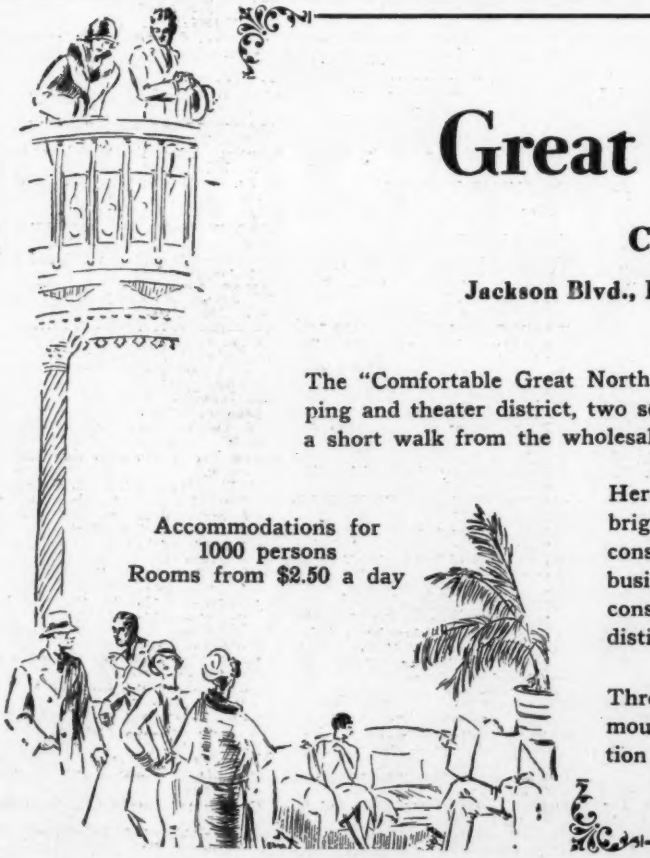

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Hotel
CHICAGO

Jackson Blvd., Dearborn and Quincy Sts.

The "Comfortable Great Northern" is conveniently located in the shopping and theater district, two squares from the financial center and just a short walk from the wholesale section.

Accommodations for
1000 persons
Rooms from $2.50 a day

Here at rates considerably moderate are large, bright, livable rooms, excellent service and the conservation environment of a substantial business institution patronized by leading, conservative environment of a substantial distinguished guests with their families.

Throughout all departments, including the famously good restaurants, considerate moderation of charges prevails.

National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Pioneer Tank & Boiler Co., Box 1926, Tulsa, Okla. See page 157.
Pittsburgh Steel Co., Union Arcade Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Pittsburgh, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
John Simmons Co., 104-10 Center St., New York, N. Y.
Standard Seamless Tube Co., 313 Sixth Ave., Pittsburgh, Pa.
The Stanwood Corp., Cincinnati, O.
Tennant Co., Union National Bank Bldg., Houston, Texas.
Tyler Tube & Pipe Co., Washington, Pa.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

TUBES, Boiler, Charcoal Iron

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Bethlehem Steel Co., Bethlehem, Pa.
Continental Supply Co., St. Louis, Missouri
Erie City Iron Works, Erie, Pa.
Freeman Mfg. Co., Racine, Wis.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Heine Boiler Co., 5319 Marcus Ave., St. Louis, Mo.
International Engineering Works, Inc., Framingham, Mass.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Monongahela Tube Co., Pittsburgh, Pa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Ocean Shore Iron Works, 550 Eighth St., San Francisco, Calif.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Reading Iron Co., Reading, Pa.
Joseph T. Ryerson & Sons, 2558 W. 16th St., Chicago, Ill.
Sculley Steel & Iron Co., Chicago, Ill.
Tyler Tube & Pipe Co., Washington, Pa.
C. J. Walton & Son, 1221 W. Main St., Louisville, Ky.

TUBES, Condenser

REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
ROSS HEATER & MFG. CO., INC., 1407-11 West Ave., Buffalo, N. Y. See Advertisers' Index.
WHEELER CONDENSER & ENGINEERING CORP., 149 Broadway, New York, N. Y. See Advertisers' Index.
YORK MANUFACTURING CO., York, Pa. See Advertisers' Index.

American Iron Works, Inc., Louisville, Ky.
American Rolling Mill Co., Middletown, Ohio
Babcock-Wilcox and Goldie-McCulloch, Ltd., Galt, Ontario, Canada
Berger Mfg. Co., Canton, Ohio
Bridgeport Brass Co., Bridgeport, Conn.
Carbondale Machine Co., Carbondale, Pa.
Chase Metal Works, Waterbury, Conn.
Freeman Mfg. Co., Racine, Wis.
Globe Steel Tubes Co., 1345 Burnham St., Milwaukee, Wis.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
U. T. Hungerford Brass & Copper Co., 80 Lafayette St., New York, N. Y.
Illinois Glass Co., Alton, Ill.
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National Supply Co., Toledo, Ohio
Pittsburgh Steel Products Co., Pittsburgh, Pa.

TUBES, Pitot

FORT WORTH LABORATORIES, 828½ Monroe St., Ft. Worth, Texas. See Advertisers' Index.

The American Blower Co., 6004 Russell, Detroit, Mich.

TUBES, Stainless or Rustless

United Alloy Steel Corp., Canton, Ohio.

TUBES, Still

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TULSA BOILER & MACHINERY CO., P. O. Box 1963, Tulsa, Okla. See Advertisers' Index.

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Berger Mfg. Co., Canton, Ohio
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TUBING, Brazed

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TUBING, Gauge

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TUBING, Lead Lined

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TUBING, Metal

American Brass Co., Waterbury, Conn.
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TUBING, Seamless

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TURBINES, Steam

DE LAVAL STEAM TURBINE CO., Trenton, N. J. See Advertisers' Index.
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Thomas Pump Works, 154 Spring St., New York, N. Y.
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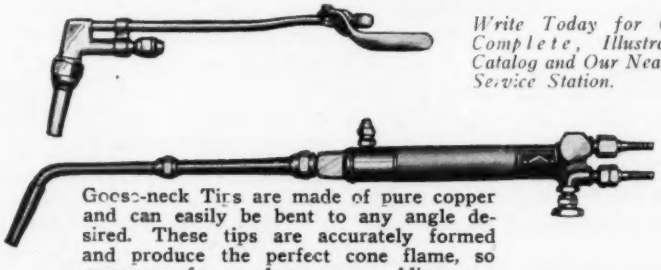

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HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

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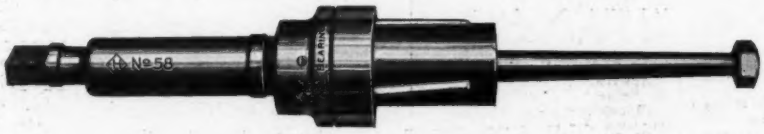
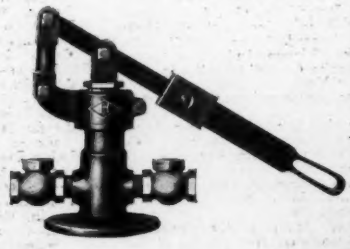


TOOLS FOR THE OIL INDUSTRIES

Hydraulic Pressure Pumps, 8000 pounds
Tube Expanders for Cracking Still Tubes
Hydraulic Pressure Pumps, 2000 pounds.
Tube Expanders for Condenser Tubes
Hydraulic Pressure Pumps, 500 pounds.
Tube Expanders for Steam Boilers
Screw Punches for Structural Shapes
Tube Expanders for Pipe Work
Screw Punches for Plate Work
Flaring Tools for Still Tubes
Beading Tools for Still Tubes
Hydraulic Jacks
Hydraulic Punches



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VALVES, Check

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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. Williams Valve Co., Spring Grove Ave. & Township St., Cincinnati, Ohio. See page 35.

Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
American Valve Co. 170 Mansion St., Coxsackie, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
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H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
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Chapman Valve Mfg. Co., Indian Orchard, Mass.
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Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ohio Brass Co., Mansfield, Ohio.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Scott Valve Mfg. Co., Detroit, Mich.
A. P. Smith Mfg. Co., East Orange, N. J.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Trill Indicator Co., Center St., Corry, Pa.
Utility Mfg. Co., Cudahy, Wis.
The Youngstown Sheet & Tube Co., Youngstown, Ohio

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HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Valve Co. 170 Mansion St., Coxsackie, N. Y.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
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Continental Supply Co., St. Louis, Missouri
Darling Valve & Mfg. Co., Williamsport, Pa.
Eastwood Wire Mfg. Co., Belleville, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Globe Automatic Sprinkler Co., 2035 Washington Ave., Philadelphia, Pa.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
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F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
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National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
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Wm. Powell Co., Cincinnati, Ohio
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Richmond Engineering Co. 935, Brook Ave., Box 514, Richmond, Va.
John Simmons Co., 104-10 Center St., New York, N. Y.
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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa. See Advertisers' Index.
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SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Carbic Mfg. Co., Duluth, Minn.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
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Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Lalor Fuel Oil System Co., Baltimore. Md.
Locke Regulator Co., Salem, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Mason Regulator Co., Boston, Mass.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
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Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
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Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union Na-
Scott Valve Mfg. Co., Detroit, Mich.
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Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Titusville Iron Works, Titusville, Pa.

VALVES, Control

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THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
THE REFINERY SUPPLY CO., 4th & Detroit Sts., Tulsa, Okla. See Advertisers Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
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Continental Supply Co., St. Louis, Missouri
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Foster Engineering Co., Newark, N. J.
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Lunkenheimer Company, Cincinnati, Ohio.
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National Supply Co., Toledo, Ohio
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Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
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Plouff Co., 170 Summer St., Boston, Mass.
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Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
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Thomas Pump Works, 154 Spring St., New York, N. Y.

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FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
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NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
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Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
American Tank Co., Okla. City, Okla.
Atlas Valve Co., 282 South St., Newark, N. J.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
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Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Coffin Valve Co., Neponset, Mass.
Continental Supply Co., St. Louis,
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McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
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VALVES, Foot

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Emerson Pump & Valve Co., Inc., Alexandria, Va.

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Bashlin Co., Warren, Pa.

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KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
METRIC METAL WORKS, Erie, Pa. See Advertisers' Index.
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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Gas Construction Co., Newton, Iowa
American Tank Co., Okla. City, Okla.
American Valve Co. 170 Mansion St., Coxsackie, N. Y.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Continental Supply Co., St. Louis, Missouri
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Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., 1 Exchange Place, Jersey City, N. J.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Hart Co., Inc., Williamsport, Pa.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Jenkins Bros., 80 White St., New York, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
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Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Oil Well Supply Co., Pittsburgh, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
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NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem, Mass.
National Supply Co., Toledo, Ohio
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scott Valve Mfg. Co., Detroit, Mich.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Gate

HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Adevertisers' Index...
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave., & Township St., Cincinnati, Ohio. See Advertisers' Index.

The Alcumite Corporation, Dayton, Ohio.
American District Steam Co., N. Tonawanda, N. Y.
American Valve Co. 170 Mansion St., Coxsackie, N. Y.
The Barber Asphalt Co., 1600 Arch St., Philadelphia, Pa.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Boyts, Porter & Co., Connellsville, Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Butler Mfg. Co., 1124 Grand Ave., Kansas City, Mo.
Chapman Valve Mfg. Co., Indian Orchard, Mass.
Coffin Valve Co., Neponset, Mass.
Continental Supply Co., St. Louis, Missouri
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Driver-Harris Co., Harrison, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., 1 Exchange Place, Jersey City, N. J.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., New York, N. Y.
Grinnell Co., Inc., Providence, R.I.
Harrisburg Pipe & Pipe Bending Co,. Houston, Texas
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Independent Foundry Co., 73 York St., Portland, Ore.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Ohio Brass Co., Mansfield, Ohio.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
A. P. Smith Mfg. Co., East Orange, N. J.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Thomas Pump Works, 154 Spring St., New York, N. Y.
Vogt Brothers Mfg. Co., 1402 W. Main St., Louisville, Ky.
Western Gas Construction Co., Fort Wayne, Ind.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

VALVES, Swing Gate

Buckeye Iron & Brass Works, Dayton, Ohio

VALVES, Globe

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
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SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Albany Steam Trap Co., 317-319 N. Pearl St., Albany, N. Y.
American Valve Co. 170 Mansion St., Coxsackie, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Bashlin Co., Warren, Pa.
The Bayer Co., 4067 Park Ave., St. Louis, Mo.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Carbondale Machine Co., Carbondale, Pa.
Continental Supply Co., St. Louis, Missouri
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Driver-Harris Co., Harrison, N. J.
Eastwood Wire Mfg. Co., Belleville, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
The Edward Valve & Mfg. Co., East Chicago, Ind.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Grinnell Co., Inc., Providence, R.I.
Hart Co., Inc., Williamsport, Pa.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Mallable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Milwaukee Boiler Mfg. Co., 35th St. & National Ave., Milwaukee, Wis.
Nason Manufacturing Company, 71 Fulton St., New York. N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ohio Brass Co., Mansfield, Ohio.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stewart Machinery Co., Buder Bldg.' 7th and Market Sts., St. Louis, Mo.
Thomas Pump Works, 154 Spring St., New York, N. Y.

VALVES, Globe, Angle and Cross

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
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HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
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The Bayer Co., 4067 Park Ave., St. Louis, Mo.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Carbondale Machine Co., Carbondale, Pa.
Driver-Harris Co., Harrison, N. J.
Eastwood Wire Mfg. Co., Belleville. N. J.
Edna Brass Mfg. Co., 525-33 Reading Road, Cincinnati, Ohio.
The Edward Valve & Mfg. Co., East Chicago, Ind.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Grinnell Co., Inc., Providence, R.I.
Hart Co., Inc., Williamsport, Pa.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Morrison Bros., Dubuque, Iowa.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Ohio Brass Co., Mansfield, Ohio.
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The Randle Machinery Co., 1723 Power St., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Hard Lead

United Lead Co., 111 Broadway, New York, N. Y.

VALVES, Hose

WALWORTH COMPANY, 88 Pear St., Boston, Mass... See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati. Ohio. See Advertisers' Index.

American Valve Co. 170 Mansion St., Coxsackie, N. Y.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Indian Orchard, Mass.
Darling Valve & Mfg. Co., Williamsport, Pa.
Eddy Valve Co., Waterford, N. Y.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Grinnell Co., Inc., Providence, R.I.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Ohio Injector Co., S. Main St., Wadsworth, Ohio.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
R. D. Wood & Co., 400 Chestnut St., Philadelphia, Pa.

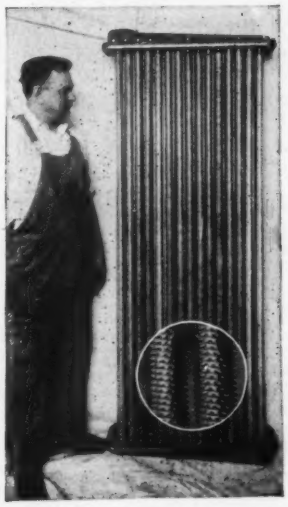
VALVES, Hot Oil

Belknap Mfg. Co., 800 Union Ave., Bridgeport, Conn.

VALVES, Hot Oil and Tar

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.



See the fins? They give more surface with fewer tubes

Heating or cooling units for air or gas may be designed with greater capacities, fewer joints, easier assembly, etc., by using

SCHUTTE KOERTING

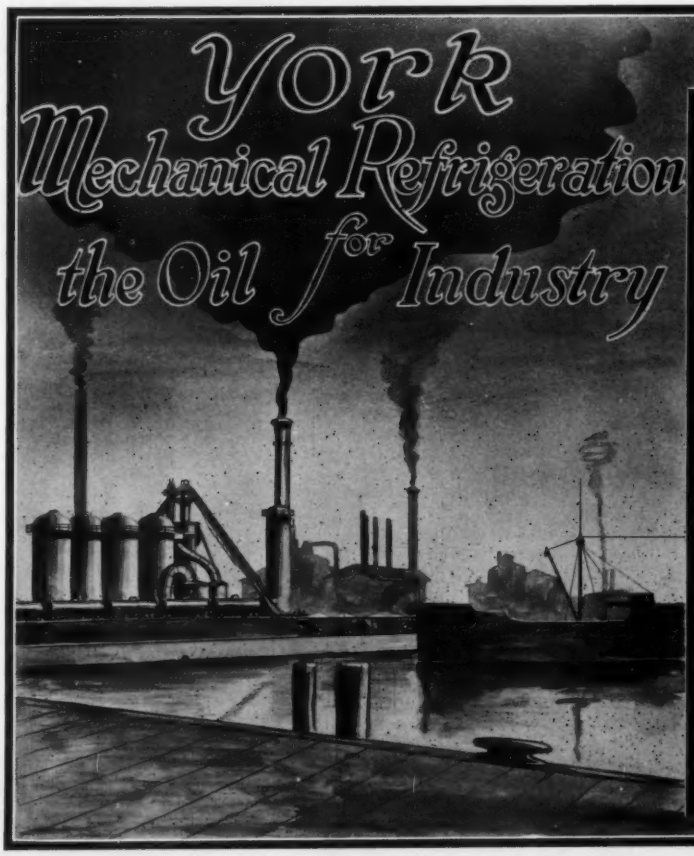
RADIAFIN TUBES

They have 6 to 10 times as much surface as plain tubes of same size

½″ to 6″—lengths up to 15′

Plain or flanged ends—with or without headers—quantity production

Schutte & Koerting Co., 1253 N. 12th St., Philadelphia, Pa.



YORK absorption refrigerating machines are built in either double pipe, atmospheric, or shell-and-tube type, and consist principally of the following parts:

GENERATOR
ANALYZER
DEHYDRATOR
CONDENSER
EXCHANGER
WEAK AQUA COOLER
ABSORBER
STRONG AQUA TANK
ANHYDROUS AMMONIA
RECEIVER, AND AQUA
AMMONIA PUMP

This equipment is particularly adaptable to refinery requirements, and can be relied upon to deliver low, dry temperatures WHEN and WHERE needed.

YORK Manufacturing Company
Ice Making and Refrigerating Machinery Exclusively
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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
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Wm. Powell Co., Cincinnati, Ohio
Reading Steel Castings Co., Reading, Pa.
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Witherup Cork Packing Co., Beaumont, Texas.

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Wm. H. Wood, 10 South Ave., Media, Delaware Co., Pa.

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KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.

VALVES, Lead Lined

SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

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Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Lever

FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
American Valve Co. 170 Mansion St., Coxsackie, N. Y.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
Darling Valve & Mfg. Co., Williamsport, Pa.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., 1 Exchange Place, Jersey City, N. J.
Foster Engineering Co., Newark, N. J.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Locke Regulator Co., Salem, Mass.
The Ludlow Valve Mfg. Co., R. A. Lon gBldg., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, Ohio.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York. N.
National Supply Co., Toledo, Ohio
Ohio Injector Co., S. Main St., Wadsworth, Ohio
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machine Co., Buder Bldg., Seventh & Market Sts., St. Louis Mo.
Titusville Iron Works, Titusville, Pa.

VALVES, Lever Angle

Buckeye Iron & Brass Works, Dayton, Ohio

VALVES, Lubricated

MERCO NORDSTROM VALVE CO., Houston, Texas. See Advertisers' Index.

VALVES, Needle

The Dole Valve Co., 1913-33 Carroll Ave., Chicago, Illinois.

VALVES, Nickel Seat

D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

VALVES, Non-Return

ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
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H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Chapman Valve Mfg. Co., Indian Orchard, Mass.
Continental Supply Co., St. Louis, Missouri
The Edward Valve & Mfg. Co., East Chicago, Ind.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Hart Co., Inc., Williamsport, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Oil Control

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
HUGHES TOOL CO., 300 Hughes St., Houston, Texas. See Advertisers' Index.
KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th and Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
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SCHUTTE & KOERTING CO., 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Adevrtisers' Index.

American Tank Co., Okla. City, Okla.
Anthony Company, 138 West Ave., Long Island City, N. Y.
Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Everlasting Valve Co., 1 Exchange Place, Jersey City, N. J.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Lunkenheimer Co., Cincinnati, Ohio.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Rue Mfg. Co., 228 Cherry St. Philadelphia, Pa.
Stewart Machinery Co.,Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

VALVES, Oxygen

KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.

International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.

VALVES, Piston

SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

VALVES, Plate

Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Treadwell Construction Co., Midland, Pa.

VALVES, Plug

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
HILLS - McCANNA CO., 2025 Elston Ave., Chicago, Ill. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.

HENRY VOGT MACHINE CO., Louisville, Ky. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.
Barrett, Haentjens & Co., Pine and Buttonwood Sts., Hazleton, Pa.
L. J. Bordo Co., 12th and Thompson Sts., Philadelphia, Pa.
A. W. Cadman Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Indian Orchard, Mass.
Coffin Valve Co., Neponset, Mass.
Driver-Harris Co., Harrison, N. J.
Eastwood Wire Mfg. Co., Belleville, N. J.
Fairbanks Co., 416-22 Broome St., New York, N. Y.
Homestead Valve Mfg. Co., Inc., Homestead, Pa.
Judson Governor Co., Rochester, New York.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N.
National Supply Co., Toledo, Ohio
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Lubricated Plug

Merco Nordstrom Valve Co., Inc., 121 2nd St., San Francisco, Cal.
United Lead Co., 111 Broadway, New York, N. Y.

VALVES, Pump

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Atlas Valve Co., 282 South St., Newark, N. J.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
Diamond Rubber Co., Inc., Akron, Ohio.
R. & J. Dick Co., Inc., Passaic, N. J.
Durabla Mfg. Co., 114 Liberty St., New York, N. Y.
Edison Packing & Sales Co., 234 State St., Boston, Mass.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Excelsior Valve Co., 106-108 Fulton St., New York, N. Y.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
Lake Erie Mfg. Co., Inc., 192-198 Chicago St., Buffalo, N. Y.
Mason Regulator Co., Boston, Mass.
Mission Sales Co., 827 First Nat. Bank Bldg., Houston, Texas.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, Ohio
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.

Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia, Pa.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
St. Louis Pump & Equipment Co., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Thomas Pump Works, 154 Spring St., New York, N. Y.
U. S. Indestructible Gasket Co., 829 E. 15th St., Brooklyn, N. Y.
Voorhees Rubber Mfg. Co., 20 Bostwick Ave., Jersey City, N.J.
Waters Governor Co., 141 Milk St., Boston, Mass.
William Gauge Co., 543 Fourth Ave., Pittsburgh, Pa.
Witherup Cork Packing Co., Beaumont, Texas.

VALVE, Reducing

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
BROWN INSTRUMENT CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
SCHUTTE & KOERTING CO. 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American District Steam Co., N. Tonawanda, N. Y.
Atlas Valve Co., 282 South St., Newark, N. J.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Burdett Mfg. Co., 309 St. Johns Court, Chicago, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
C. A. Dunham Co., The Dunham Bldg., 450 E. Ohio St., Chicago, Illinois
Julian d'Este Co., 26 Canal St., Boston, Mass.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Jenkins Bros., 80 White St., New York, N. Y.
Judson Governor Co., Rochester, New York.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kitts Mfg Co., Oswego, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
Modern Engineering Co., 3411-13 Pine Blvd., St. Louis, Mo.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, O.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Oxweld Acetylene Co., Long Island City, L. I., N. Y.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa
Perolin Co. of America, 1112 W. 37th St., Chicago, Illinois
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
John Simmons Co., 104-10 Center St., New York, N. Y.
C. E. Squires Co., E. Fortieth St. & Kelley Ave., Cleveland, Ohio.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St. Brooklyn, N. Y.
Waters Governor Co., 141 Milk St., Boston, Mass.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Watts Regulator Company, 250-252 Lowell St., Lawrence, Mass.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

VALVES, Refinery Steel

KEROTEST MFG. CO., 2525 Liberty Ave., Pittsburgh, Pa. See Advertisers' Index.

VALVES, Regulating

ALCORN COMBUSTION CO., Bellevue Court Bldg., Philadelphia, Pa. See Advertisers' Index.
GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
THE BRISTOL CO., Watrbury, Conn. See Advertisers' Index.
BROWN INSTRUMENT .CO., 4537 Wayne Ave., Philadelphia, Pa. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
MIDWEST PIPING & SUPPLY CO., Second & Miller Sts., St. Louis, Mo. See Advertisers' Index.
NATIONAL AIROIL BURNER CO., 9th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
REFINERY SUPPLY CO., Tulsa, Okla. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

American Tank Co., Okla. City, Okla.
Atlas Valve Co., 282 South St., Newark, N. J.
H. Belfield Co., 435 N. Broad St., Philadelphia, Pa.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Burdett Mfg. Co., 309 St. John Court, Chicago, Ill.
Carrick Engineering Co., 538 S. Clark St., Chicago, Ill.
Defender Automatic Regulator Co., 709 Pine St., St. Louis, Mo.
Erwin & Co., 3734-3736 Cottage Grove Ave., Chicago, Ill.
Julian d'Este Co., 26 Canal St., Boston, Mass.
Ford Regulator Valve Co., 403-407 Broome St., New York, N. Y.
Foster Engineering Co., Newark, N. J.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Jenkins Bros., 80 White St., New York, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Lalor Fuel Oil System Co., Baltimore, Md.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Mason Regulator Co., Boston, Mass.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
McDonough Coal Saving Corp'n., 3955 Grand River Ave., Detroit, Mich.
Modern Engineering Co., 2411-13 Pine Blvd., St. Louis, Mo.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, O.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
C. E. Squires Co., E. Fortieth St. & Kelley Ave., Cleveland, Ohio.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
C. J. Tagliabue Mfg. Co., 18 33rd St., Brooklyn, N. Y.
Taylor Instrument Co., Rochester, N. Y.
Waters Governor Co., 141 Milk St., Boston, Mass.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.
Wilgus Mfg. Co., 1732 E. Sixteenth St., Los Angeles, Calif.

VALVES, Relief

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
JULIAN A. CAMPBELL, 430 East 15th St., Long Beach, Cal. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Philadelphia, Pa. See Advertisers' Index.
CROSBY STEAM GAUGE & VALVE CO., 10 Rulanel St., Boston, Mass. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GRISCOM - RUSSELL CO., 814 Monadnock Bldg., Chicago, Ill. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTHERN EQUIPMENT CO., 114 W. Eleventh St., Erie, Pa. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston Mass. See Advertisers' Index.
WESTCOTT & GREIS, Inc., Tulsa, Okla. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
Ashcroft Manufacturing Co., New York, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Black, Sivalls & Bryson, Bartlesville, Okla.
Boylston Steam Specialty Co., 116 W. Illinois St., Chicago, Ill.
Boyts, Porter & Co., Connellsville Pa.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Carbondale Machine Co., Carbondale, Pa.
Coale Muffler & Safety Valve Co., 325-335 E. Oliver St., Baltimore, Md.
The Cochrane Corp., 3130 N. 17th St., Philadelphia, Pa.
Continental Supply Co., St. Louis, Missouri
Foster Engineering Co., Newark, N. J.
Frick Co., Inc., Waynesboro, Pa.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Illinois Engineering Co., Racine Ave. & 21st St., Chicago, Ill.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
Kelley & Mueller, Inc., 34 W. Thirteenth St., New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
The Kennedy Valve Mfg. Co., Elmira, N. Y.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago, Ill.
Kunkle Valve Co., 121 No. Clinton St., Ft. Wayne, Ind.
Lalor Fuel Oil System Co., Baltimore, Md.
Locke Regulator Co., Salem, Mass.
The Ludlow Valve Mfg. Co., R. A. Long Bldg., Kansas City, Mo.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McAlear Mfg. Co., 1901-07 Southwestern Ave., Chicago, Ill.
H. Mueller Mfg Co., Decatur, Ill.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
National Supply Co., Toledo, O.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
O. E. Specialty Mfg. Co., 8-12 Keefe Ave., Milwaukee, Wis.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Peabody Engineering Corp., 110 Forty Second St., New York, N. Y.
Pitts & Kitts Mfg. & Supply Co., 91 7th Ave., New York, N. Y.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
The P. H. & F. M. Roots Co., Connersville, Ind.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
"S-C" Regulator Mfg. Co., Fostoria, Ohio.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
Simplex Valve & Meter Co., 2005 S. 68th St., Philadelphia, Pa.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Thermal Efficiency Co., 1219 Scarritt Bldg., Kansas City, Mo.
Triumph Valve Mfg. Co., 24 E. Sixth St., Mansfield, Ohio
Union Water Meter Co., Worcester, Mass.
United Brass Mfg. Co., Cleveland, Ohio.
Watson & McDaniel Co., 146 N. Seventh St., Philadelphia, Pa.
Western Kieley Steam Specialty Co., 116-22 W. Illinois St., Chicago, Ill.

C. H. Wheeler Mfg. Co., 19th St. & Lehigh Ave., Philadelphia, Pa.
G. E. Witt Co., Inc., 862-64 Howard St., San Francisco, Calif.

VALVES, Reversible Seat

D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

VALVES, Rubber

GARLOCK PACKING CO., 50 Main St., Palmyra, N. Y. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

Adkins, Young & Allen Co., 561 Washington Blvd., Chicago, Ill.
Anchor Packing Co., Lafayette Bldg., Philadelphia, Pa.
Austin-Mason Co., 15 Park Row, New York, N. Y.
Stewart R. Browne Mfg. Co., New York, N. Y.
Continental Rubber Works, Nineteenth & Liberty St., Erie, Pa.
Continental Supply Co., St. Louis, Missouri
Crandall Packing Co., Palmyra, New York
The Darcoid Co., 55 Warren St., New York, N. Y.
Diamond Rubber Co., Inc., Akron, Ohio.
B. F. Goodrich Rubber Co., Akron, Ohio
Gutta Percha & Rubber Co., New York, N. Y.
Janos Asbestos Co., 26 Cortlandt St., New York, N. Y.
Jenkins Bros., 80 White St., New York, N. Y.
Geo. W. Knowlton Rubber Co., 60 Pearl St., Boston, Mass.
La Favorite Rubber Mfg. Co., Wagaraw Rd., Hawthorne, N. J.
The Manhattan Rubber Mfg. Co., Passaic, N. J.
Mission Sales Co., 827 First National Bank Bldg., Houston, Texas.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, O.
New York Belting & Packing Co., 91-93 Chamber St., New York, N. Y.
Petroleum Supply Co., Houston, Texas
Pioneer Rubber Mills, 353 Sacramento St., San Francisco, Calif.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Strong Machinery & Supply Co., 15 Walker St., New York, N. Y.
Voorhees Rubber Mfg. Co., 20 Bostwick Ave., Jersey City, N.J.

VALVES, Safety

GEO. B. ALLAN & CO., Simpson Bldg., Dallas, Texas. See Advertisers' Index.
ELLIOTT COMPANY, Jeannette, Pa. See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
NORTH AMERICAN CAR CO., 327 S. LaSalle St., Chicago, Ill. See Advertisers' Index.
OIL CONSERVATION ENGINEERING CO., Cleveland, Ohio. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th St., Brooklyn, N. Y.
American Tank Co., Okla. City, Okla.
Ashcroft Manufacturing Co., New York, N. Y.
Baker Ice Machine Co., 3601 Evans St., Omaha, Nebr.
Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
Carbondale Machine Co., Carbondale, Pa.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Coale Muffler & Safety Valve Co., 325-335 E. Oliver St., Baltimore,
Continental Supply Co., St. Louis, Missouri
Driver-Harris Co., Harrison, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Golden-Anderson Valve Specialty Co., 1228 Fulton Bldg., Pittsburgh, Pa.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 80 White St., New York, N. Y.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kunkle Valve Co., 121 No. Clinton St., Ft. Wayne, Ind.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, O.
LaSalle St., Chicago, Ill.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Pittsburgh Valve & Fittings Co., Barberton, Ohio.
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
Refrigerating Specialties Co., 714 S. Sacramento Blvd., Chicago, Ill.
John Robertson & Co., Inc., 133 Water St., Brooklyn, N. Y.
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scott Valve Mfg. Co., Detroit, Mich
John Simmons Co., 104-10 Center St., New York, N. Y.
Star Brass Mfg. Co., 53 Oliver St Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.
Triumph Valve Mfg. Co., 24 E. Sixth St., Mansfield, Ohio

VALVES, Pop Safety

GEO. B. ALLAN & CO., Simpson Bldg., Dallas. Texas. See Advertisers' Index.
THE CHAPLIN - FULTON CO., 28 Penn Ave., Pittsburgh Pa., See Advertisers' Index.
FISHER GOVERNOR CO., Marshalltown, Iowa. See Advertisers' Index.
GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO. 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.
WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

American Schaeffer & Budenberg Corp., Berry & S. 5th Sts., Brooklyn, N. Y.
Ashcroft Manufacturing Co., New York, N. Y.
Ashton Valve Co., 161 First St., Cambridge, Boston, Mass.
Buckeye Iron & Brass Works, 370 E. 3rd St., Dayton, Ohio.
A. W. Cash Co., 3rd & Eldorado Sts., Decatur, Ill.
Md.
Coale Muffler & Safety Valve Co.,
Continental Supply Co., St. Louis, Missouri
Detroit Lubricator Co., 5938 Trumbull Ave., Detroit, Mich.
Driver-Harris Co., Harrison, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Equitable Meter and Mfg. Co., 422-444 First Ave., Pittsburgh, Pa.
Heine Boiler Co., 5319 Marcus Ave., St., Louis, Mo.
Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
International Heater Co., 101 Park Ave. Utica, N. Y.
Jarecki Mfg. Co., Erie, Pa.
F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.
The Kellogg-Mackay Co., 2020-30 Walnut St., Kansas City, Mo.
Kunkle Valve Co., 121 No. Clinton St., Ft. Wayne, Ind.
F. J. Low Co., Inc., 15 W. 44th St., New York, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
McRea & Roberts Co., 211 Campbell Ave., Detroit, Mich.
Milwaukee Boiler Mfg. Co., 35th St., & National Ave., Milwaukee, Wis.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y.
National Supply Co., Toledo, O.
National Valve & Mfg. Co., 31st and Liberty, Pittsburgh, Pa.
Oil Well Supply Co., Pittsburgh, Pa.
Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
The J. A. Rossiter Co., Union National Bank Bldg., Houston, Tex.
Scott Valve Mfg. Co., Detroit, Mich.
John Simmons Co., 104-10 Center St., New York, N. Y.
The Stanwood Corp., Cincinnati, O.
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Self Grinding

GEO. B. ALLAN & CO., Simpson Bldg., Dallas. Texas. See Advertisers' Index.

VALVES, Sight Feed

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
D. T. WILLIAMS VALVE CO., Spring Grove Ave. & Township St., Cincinnati, Ohio. See Advertisers' Index.

Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, Ohio.
Nason Manufacturing Company, 71 Fulton St., New York, N. Y
Wm. W. Nugent & Co., 410-412 No. Hermitage Ave., Chicago, Ill.
Petroleum Supply Co., Houston, Texas
Plouff Co., 170 Summer St., Boston, Mass.
Wm. Powell Co., Cincinnati, Ohio
John Simmons Co., 104-10 Center St., New York, N. Y.
Stewart Machinery Co., Buder Bldg., Seventh & Market Sts., St. Louis, Mo.

VALVES, Solenoid Operated

THE BRISTOL CO., Waterbury, Conn. See Advertisers' Index.
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GREENE BROTHERS, 524-8 Seventh St., Wichita Falls, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
SCHUTTE & KOERTING CO 12th & Thompson Sts., Philadelphia, Pa. See Advertisers' Index.

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Atlas Valve Co., 282 South St., Newark, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
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VALVES, Still Safety

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VALVES, Super-Heated Steam, Steel

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The Kennedy Valve Mfg. Co., Elmira, N. Y.
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Lunkenheimer Co., Cincinnati, Ohio.
Mason Regulator Co., Boston, Mass.
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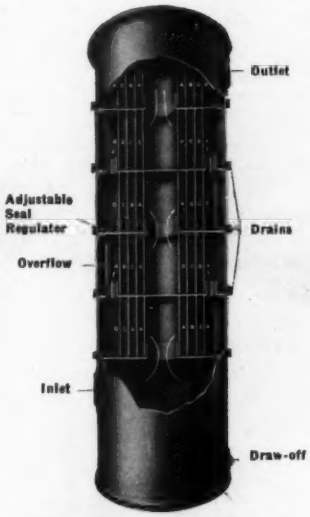

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Plouff Co., 170 Summer St., Boston, Mass.

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MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
NEILAN SCHUMACHER CO., 641 E. Santa Fe St., Los Angeles, Calif. See Advertisers' Index.

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Philadelphia Coppersmithing Co., 222 N. Front St., Philadelphia, Pa.

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OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

Brooks Engineering Corp., 314 E. 12th St., Los Angeles, Calif.
Pangborn Corp., Hagerstown, Md.

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VENTILATORS, Roof

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WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.
WYATT METAL & BOILER WORKS, Dallas, Texas. See Advertisers' Index.

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SCHUTTE & KOERTING CO., 1165 Thompson St., Philadelphia, Pa. See Advertisers' Index.

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FORT WORTH LABORATORIES, 828½ Monroe St., Fort Worth, Texas. See Advertisers' Index.
MAINTENANCE ENGINEERING CORP., P. O. Box 1402, 2000 Harrington St., Houston, Texas. See Advertisers' Index.
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WASTE, Wool Packing

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WATCHES, Stop

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WATER SYSTEMS, Cold Drinking

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CHIPMAN CHEMICAL ENGINEERING CO., INC., Bound Brook, N. J. See Advertisers' Index.

WELDING, Equipment

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WHISTLES, Siren

A. & F. Brown Co., 79 Barclay St., New York, N. Y.

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WINCHES, Safety Tank

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OIL CONSERVATION ENGINEERING CO., 877 Addison Road, Cleveland, Ohio. See Advertisers' Index.

UNITED IRON WORKS CO., Ridge Arcade Bldg., Kansas City, Mo. See Advertisers' Index.

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WINDOWS, Metal

E. Van Noorden Co., 100 Magazine St., Roxbury, Mass.

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Petroleum Supply Co., Houston, Texas.

Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

John Simmons Co., 104-10 Center St., New York, N. Y.

WRENCHES, Pipe

A. Y. McDONALD MFG. CO., Dubuque, Iowa. See Advertisers' Index.

Armstrong Bros. Tool Co., 302 N. Francisco Ave., Chicago, Ill.

Brazelton, Wessendorff & Nelms, Houston, Texas.

Continental Supply Co., St. Louis, Missouri

Greenfield Tap & Die Corp'n., Greenfield, Mass.

Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.

F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.

Larco Wrench & Mfg. Corp., 7800 Woodlawn Ave., Chicago, Ill.

Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.

Nason Manufacturing Company, 71 Fulton St., New York, N. Y.

National Supply Co., Toledo, O.

Oil Well Supply Co., Pittsburgh, Pa.

Henry B. Pancoast & Co., 940-962 N. Front St., Philadelphia, Pa.

Petroleum Supply Co., Houston, Texas

Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

John Simmons Co., 104-10 Center St., New York, N. Y.

The Youngstown Sheet & Tube Co., Youngstown, Ohio

WRENCHES, Chain Pipe

Trimont Mfg. Co., 55 Amory St., Roxbury, Boston, Mass.

WRENCHES, Tap

WALWORTH COMPANY, 88 Pearl St., Boston, Mass. See Advertisers' Index.

Brazelton, Wessendorff & Nelms, Houston, Texas.

Continental Supply Co., St. Louis, Missouri

Greenfield Tap & Die Corp'n., Greenfield, Mass.

Horton Machine Works, 4th and Magee Sts., Elmira, N. Y.

F. W. Jesup & Co., 90-92 West Broadway, New York, N. Y.

Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.

National Supply Co., Toledo, O.

Petroleum Supply Co., Houston, Texas

Shapleigh Hardware Co., 315 Washington Ave., St. Louis, Mo.

John Simmons Co., 104-10 Center St., New York, N. Y.

The L. S. Starrett Co., Athol, Mass.

REFINERS' SUPPLIES

ACETIC ACIDS
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio
Grasselli Chemical Co., Cleveland, Ohio.
Greene Bros., Wichita Falls, Texas.
Charles Lenning & Co., Philadelphia, Pa.
The Refinery Supply Co., Fourth and Detroit Sts., Tulsa, Oklahoma.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

ACTIVATED CARBON
Joe Barlow, Crowdus & Taylor, Dallas, Texas.

ALUMINUM POWDER
Aluminum Company of America, 2400 Oliver Bldg., Pittsburgh, Pa.
American Paint & Supply Co., P. O. Box 506, Dallas, Texas.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Greene Brothers, Wichita Falls, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

AMMONIA
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Barrett Co., 40 Rector St., New York, N. Y.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Cleveland, Ohio.
Greene Borthers, Wichita Falls, Texas.
Herf & Frerichs Chemical Co., 925-32 Pierce Bldg., St. Louis, Mo.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
National Ammonia Co., 3600 N. Broadway, St. Louis, Mo.
Ward Chemical Company, 226 Atco Bldg., Tulsa, Okla.

ASH, Bone
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
The Denver Fire Clay Co., P. O. Box 1107, Denver, Colo.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Greene Brothers, Wichita Falls, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

ASH, Soda
American Trona Corporation, New York, N. Y.
Arnold Hoffman Co., Providence, R. I.
Aubrey Bartlet Co., New Orleans, La.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Brunner, Mond of Canada, Ltd., Amherstburg, Ont.
Consumers Chemical Co., Philadelphia, Pa.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
H. R. McMillan Co., New Orleans, La.
Michigan Alkali Co., 21 E. 40th St., New York, N. Y.
Mound City Chemical Co., St. Louis, Mo.
Solvay Process Co., Syracuse, N. Y.
Welch Holme & Clark Co., 381 W. St., New York, N. Y.
Whitelaw Brothers Chemical Co., 316 S. Commercial St., St. Louis, Mo.
Wing & Evans, 40 Rector St., New York, N. Y.

ASPHALT
The Philip Carey Co., Lockland, Ohio.

BENZOL
Algoma Steel Corporation, Ltd., Sault St. Marie, Ont.
Baker Chemical Co., Phillipsburg, N. J.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Barrett Co., New York, N. Y.
British Empire Steel Corp., Ltd., Montreal, Que.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carnegie Steel Co., Pittsburgh, Pa.
Colorado Fuel & Iron Company, Denver, Colo.
Cooper & Cooper, Inc., New York City.
Dominion Tar & Chemical Co., Ltd., Sault St. Marie, Ont.
Greene Brothers, Wichita Falls, Texas.
Globe Chemical Co., Cincinnati, O.
Illinois Steel Co., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Jordan Coal Tar Products Co., New York, N. Y.
Koppers Products Co., Pittsburgh, Pa.
Lackawanna Steel Co., Buffalo, N. Y.
Mallinckrodt Chemical Works, St. Louis, Mo.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
Sherwin-Williams Co., Cleveland, Ohio.
Steel Company of Canada, Ltd., Toronto, Ont.
Tennessee Coal & Iron Co., Birmingham, Ala.
Toronto Chemical Co., Toronto, Ont.
Woodward Iron Co., Woodward, Ala.

CALCIUM CARBIDE
Magnolia Gas Products, Houston, Texas.

CARBON BLACK
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.
Doggett, Stanley, New York, N. Y.
Greene Brothers, Wichita Falls, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Texas Chemical Co., Scanlan Bldg., Houston, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

CHEMICALS, All Kinds
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Central Scientific Co., 460 E. Ohio St., Chicago, Ill.
The Denver Fire Clay Co., P. O. Box 1107, Denver, Colo.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Cleveland, Ohio.
Greene Brothers, Wichita Falls, Texas.
The Kelbfleisch Corp., 31 Union Square, New York, N. Y.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
Merck & Co., 45 Park Place, New York City.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Ozark Chemical Co., Tulsa, Okla.
Parke-Davis & Co., New Orleans, La
Pendleton & Arto, Houston, Texas.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
Texas Chemical Co., Scanlan Bldg., Houston, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
The Warner Chemical Co., 52 Vanderbilt Ave., New York, N. Y.

CHLORINE, Liquid
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Great Western Chemical Co., 9 Main St., San Francisco, Cal.
Greene Brothers, Wichita Falls, Texas.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

DEHYDRATING CHEMICALS
The Vez Co., 2221 Laws St., Dallas, Texas.

EMULSION TREATING CHEMICALS
The Vez Co., 2221 Laws St., Dallas, Texas.

FILLER, Paste Iron
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Kuhn Paint and Varnish Works, Houston, Texas.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

FULLERS EARTH
Attapulgus Clay Co., Attapulgus, Ga.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Doggett, Stanley, New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Southern Refractories Co., Fort Payne, Ala.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

HYDROGEN
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Magnolia Gas Products Co., Houston, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

LACQUER, Shafting
Kuhn Paint and Varnish Works, Houston, Texas.

LARD OIL
Armour & Co., Chicago, Ill.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Fred G. Clark & Co., Cleveland, Ohio.
Cudahy Packing Co., Chicago, Ill.
W. A. Freeman & Co., Ltd., London, Ont.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Harris Abattoir Company, Ltd. Toronto, Ont.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
S. F. Lawrason & Co., Ltd., London, Ont.
Magnolia Gas Products Co., Houston, Texas.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Morris & Co., Chicago, Ill.
Pierce Oil Co., Columbus, Ohio.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
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T. M. Sinclair & Co., Cedar Rapids, Iowa.
Swift & Co., Chicago, Ill.
Swan & Finch, New York, N. Y.
Ward Chemical Company, 226 Atco Bldg., Tulsa, Okla.
Welch Holme & Clark Co., 381 W. St., New York, N. Y.
Wilson & Co., Chicago, Ill.
Wilson-Martin Co., Philadelphia, Pa.
Yocum Faust, Ltd., London, Ont.

LIME
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
Whitelaw Brothers Chemical Co., 316 S. Commercial St., St. Louis, Mo.

LIME, Chloride of
Alpha Chemical Company, Ltd., Kitchener, Ont.
B. T. Babbitt, 15 W. 34th St., New York, N. Y.
H. J. Bakers & Brothers, New York, N. Y.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Canada Color & Chemical Co., Ltd., Toronto, Ont.
Canadian Salt Co., Ltd., Windsor, Ont.
Carus Chemical Co., LaSalle, Ill.
Champion Chemical Works, Chicago, Ill.
Charles Cooper & Co., New York, N. Y.
Glenco Lime & Cement Co., St. Louis, Mo.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Works, Cleveland, Ohio.
Great Western Electrochemical Co., San Francisco, Cal.
Great Western Chemical Co., 9 Main St., San Francisco, Cal.
Greene Brothers, Wichita Falls, Texas.
Heil Chemical Co., St. Louis, Mo.
Arnold Hoffman & Co., Providence, Rhode Island.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
Lehigh Lime Co., Chicago, Ill.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
Niagara Alkali Co., Niagara Falls, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Produit Belgerde Montagny, Montagny, Que.
Sinclair Manufacturing Co., Toledo, Ohio.
Stauffer Chemical Co., San Francisco, California.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
John C. Wiarda & Co., Brooklyn, N. Y.

LIME, Hydrated
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Dittlinger Lime Co., New Braunfels, Texas.
Stanley Doggett, New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
Magnolia Gas Products Co., Houston, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

LIME, Lump
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Dittlinger Lime Co., New Braunfels, Texas.
F. W. Jesup & Co., 90-92 Broadway, N. Y.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

LITHARGE
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Stanley Doggett, New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
National Lead Co., 111 Broadway, New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

MURIATIC ACID
Joe Barlow, Crowdus & Taylor, Dallas, Texas.

NAVAL STORES
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Columbia Naval Stores Co., New York, N. Y.
Stanley Doggett, New York, N. Y.
Fernwood Lumber Co., Fernwood, Miss.
Flynn-Harris-Bullard Co., Jacksonville, Fla.
General Naval Stores, New York, N. Y.
General Naval Stores Co., New Orleans, La.
Georgia Resin Oil Co., Atlanta, Ga.
Gillican Supply Co., New Orleans, La.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
Gulf Naval Stores Co., New Orleans, La.
Hercules Powder Co., East Wilmington, Delaware.
Lutcher & Moore Turpentine Works, Orange, Texas.
McMillan Naval Stores Co., Beaumont, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Wade & Sell, Trenton, Fla.

NICKEL
Frictionless Metal Co., 1450-60 Colling St., St. Louis, Mo.

OIL TREATING CHEMICALS
The Vez Co., 2221 Laws St., Dallas, Texas.

OILS, All Purpose
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Emery Mfg. Co., Bradford, Pa.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Monarch Manufacturing Co., Council Bluffs, Iowa.

OILS, Animal
Armour & Co., Chicago, Ill.
Armour & Co., Kansas City, Mo.
Armour & Co., Fort Worth, Texas.
Armstrong Packing Co., Dallas, Texas.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Buffalo Refining Co., Buffalo, N. Y.
Canadian Packing Co., Ltd., Toronto, Ont.
Consolidated Rendering Co., Boston, Mass.
Cudahy Packing Co., Chicago, Ill.
Davidson Commission Co., Chicago, Ill.
Dodd Packing Co., Buffalo, N. Y.
Elbert & Co., 27 William St., New York, N. Y.
The Filtrol Co., Los Angeles, Cal.
Gunns Ltd., Toronto, Ont.
Harris Abattoir Co., Ltd., Toronto, Ont.
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S. L. Jones & Co., San Francisco, Cal.
S. F. Lawrason Co., London, Ont.
Lever Brothers, Toronto, Ont.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Morris & Co., Kansas City, Mo.
National Oil Products Co., Harrison, N. J.
Palmolive Companies, Ltd., Toronto, Ont.
T. T. Pergament & Co., Produce Exchange, New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Proctor & Gamble Co., Cincinnati, Ohio.
Pure Oil Co., Columbus, Ohio.
Wm. C. Robinson & Son Co., Baltimore, Md.
Swift & Co., Kansas City, Mo.
Swift & Co., Chicago, Ill.
Swift Canadian Co., Ltd., Toronto, Ont.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
Welch Holme & Clark Co., 381 W. St., New York City.
Yocum, Faust, Ltd., London, Ont.

OIL, Fish
H. J. Baker & Brothers, New York, N. Y.
Balfour, Guthrie & Co., San Francisco, Cal.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Cook & Swan Co., New York, N. Y.
Consolidated Whaling Corp., Ltd., Victoria, B. C.
Fisheries Products Co., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Globe Oil Mills, Los Angeles, Cal.
Hewlett Brothers Co., New York, N. Y.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
S. L. Jones & Co., San Francisco, Cal.
Maritime Fish Corp., Ltd., Montreal, P. Q.
North Pacfiic Trading Packing Co., San Francisco, Cal.
Oriental Vegetable Oils Co., San Francisco, Cal.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Pure Oil Co., Columbus, Ohio.
Wm. Robinson & Son Co., Baltimore, Md.
Salem Oil Grease Co., Salem, Mass.
Sullivan Oil Co., Chicago, Ill.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
Swan & Finch Co., New York, N. Y.
Yocum Faust Ltd., London, Ont.

OIL, Gloss
American Paint & Supply Co., P. O. Box 506, Dallas, Texas.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Kuhn Paint and Varnish Works, Houston, Texas.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

NEATSFOOT OIL
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
F. W. Jesup & Co., 90-92 Broadway, N. Y.
S. F. Lawrason Co., Ltd., London, Ont.
Morris & Co., Kansas City, Mo.
Wm. C. Robinson & Son Co., Baltimore, Md.
Sinclair & Co., Cedar Rapids, Ia.
Swan & Finch, New York, N. Y.
Swift & Co., Chicago, Ill.
Swift Canadian Co., Ltd., Toronto, Ont.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
Welch Holme & Clark Co., 381 W. St., New York, N. Y.
Wilson & Co., Chicago, Ill.
Yocum, Faust, Ltd., London, Ont.

OIL, Pine
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

OIL, Vegetable
Fred C. Adams Co., Chicago, Ill.
American Cocoanut Butter Co., Chicago, Ill.
American Trading Co., San Francisco, Cal.
Anchor Refining Co., Jersey City, N. J.
Armstrong Packing Co., Dallas, Texas.
Blanton Co., St. Louis, Mo.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Canada Starch Co., Toronto, Ont.
Cook & Swan Co., New York, N. Y.
A. Daigger & Co., Chicago, Ill.
Dayton Oil Co., Dayton, Ohio.
Gunns Ltd., Toronto, Ont.
Harris Abattoir Co., Ltd., Toronto, Ont.
Jones Packing & Preserving Co., Smith's Falls, Ont.
A. Klipstein & Co., New York, N. Y.
Lever Brothers, Toronto, Ont.
Liberty Cotton Oil Co., Oklahoma City, Okla.
Magnolia Gas Products Co., Houston, Texas.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Murray Oil Products Co., Philadelphia, Pa.
Nacogdoches Oil Mill, Nacogdoches, Texas.
National Oil Products Co., Harrison, N. J.
Oil & Chemical Corporation, Chicago, Ill.
Oriental Vegetable Oil Co., San Francisco, Cal.
Palmolive Co., Ltd., Toronto, Ont.
Pure Oil Co., Columbus, Ohio.
Rub-No-More Co., Fort Wayne, Ind.
Swan & Finch Co., New York, N. Y.
Swift Canadian Co., Ltd., Toronto, Ont.
Swiftide Oil Co., Fairhaven, N. B.
Thomson & Co., New York, N. Y.
Ward Chemical Co., 226 Atco Bldg., Tusa, Okla.
Werner G. Smith Co., Cleveland, Ohio.
Welch Holme & Clark Co., 381 W. St., New York, N. Y.

OLEIC ACIDS
Fred C. Adams Co., Chicago, Ill.
Armour & Co., Chicago, Ill.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Choates Cooper & Co., New York, N. Y.
Chas. Cooper & Co., New York, N. Y.
Davidson Commission Co., Chicago, Ill.
Dayton Oil Co., Dayton, Ohio.
Emery Candle Co., Cincinnati, O.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Toronto, Ont.
Mallincrodt Chemical Works, St. Louis, Mo.
Merck & Co., New York, N. Y.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Proctor & Gamble Co., Cincinnati, Ohio.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
Rub-No-More Co., Fort Wayne, Ind.
The M. Werk Co., Cincinnati, O.
Welch Holme & Clark Co., 381 W. St., New York, N. Y.
Wilson-Martin Co., Philadelphia, Pa.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

OXIDE, Zinc
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Cleveland, Ohio.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

OXYGEN
Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
International Oxygen Co., 796 Frelinghuysen Ave., Newark, N. J.
Linde Air Products Co., Carbide and Carbon Bldg., 30 E. 42nd St., New York, N. Y.
Magnolia Gas Products Co., Houston, Texas.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

PERMANGANATE
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carus Chemical Co., La Salle, Ill.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

PLUGS, Tar
The Oil Conservation Engineering Co., Cleveland, Ohio.

ROSIN
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

SAL SODA
Adams Chemical Co., Ltd., Montreal, Que.
American Trona Corporation, New York, N. Y.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
British American Paint Co., Ltd., Victoria, B. C.
California Soda Works, Los Angeles, Cal.
Church & Dwight Co., 19 Cedar St., New York, N. Y.
Consumers Chemical Co., Philadelphia, Pa.
John Cowan & Co., Ltd., Montreal,
General Chemical Co., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Cleveland, Ohio.
Greene Brothers, Wichita Falls, Texas.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
S. F. Lawrason Co., Ltd., London, Ont.
Leeds Chemical Co., St. Louis, Mo.
Morton Salt Co., Chicago, Ill.
Mound City Chemical Co., St Louis, Mo.
National Crystals Co., Irvington, N. J.
Pennsylvania Chemical Works, Philadelphia, Pa.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
E. M. Sergeant Co., 131 Cedar St., New York, N. Y.
Stauffer Chemical Co., San Francisco, Cal.
Swift & Co., St. Louis, Mo.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
William Wilson & Son, Ltd., Toronto, Ont.

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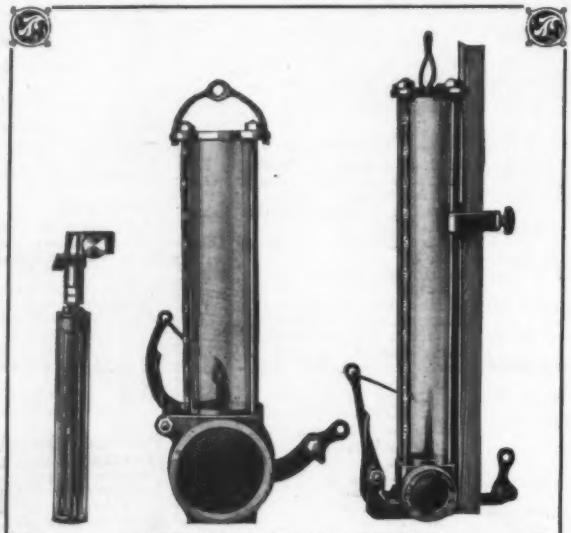

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SODA, Bicarbonate of

Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Greene Brothers, Wichita Falls, Texas.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
The Mathieson Alkali Works, Inc., 25 W. 4rd St., New York, N. Y.
Mathieson Alkali Works, Inc., 250 Park Ave., New York, N. Y.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

SODA, Caustic

Aubrey Bartlett, New Orleans, La.
B. T. Babbitt Co., 15 W. 34th St., New York, N. Y.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Brown Co., Portland, Maine.
Canadian Salt Co., Ltd., Windsor, Ont.
Consumers Chemical Co., Philadelphia, Pa.
Diamond Alkali Co., Pittsburgh, Pa.
Dow Chemical Co., Midland, Ohio.
General Chemical Co., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., St. Louis, Mo.
Green Brothers, Wichita Falls, Texas.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
Great Western Chemical Co., 9 Main St., San Francisco, Cal.
Arnold Hoffman & Co., Providence, R. I.
Mallinckrodt Chemical Co., St. Louis, Mo.
Mathieson Alkali Works, Inc., 250 Park Ave., N. Y.
Michigan Alkali Works, Detroit, Mich.
Mound City Chemical Co., St. Louis, Mo.
Nichols Chemical Co., Toronto, Ont.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
Solvay Process Co., New York, N. Y.
William D. Seymour Co., New Orleans, La.
Joseph Turner & Co., New Orleans, La.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.
Welch Holme & Clark Co., 381 W. St., New York City.
Whitelaw Brothers, St. Louis, Mo.
Wing & Evans, Columbus, Ohio.

SODA, Silicate of

Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Baugh & Sons Co., Philadelphia, Pa.
Buckeye Soda Products Co., Cincinnati, Ohio.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Cibora Mfg. Co., St. Louis, Mo.
General Chemical Co., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Metalene Chemical Co., 839 Society for Savings, Cleveland, O.
Mound City Chemical Co., St. Louis, Mo
Philadelphia Quartz Co., Philadelphia, Pa.
River Raisin Paper Co., Monroe, Mich.
Welch, Holme & Clark Co., New York City, N. Y.
Western Paper Makers Chemical Co., Kalamazoo, Mich.
Whitelaw Brothers Chemical Co., St. Louis, Mo.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

SULPHURIC ACID

Aetna Chemical Co., Drummondville, Que.
Alabama Chemical Co., Montgomery, Ala.
Algoma Steel Corp, Ltd., Salt St. Marie, Ont.
American Smelting & Refining Co., New York, N. Y.
American Zinc & Chemical Co., Pittsburgh, Pa.
American Zinc, Lead & Smelter Co., St. Louis, Mo.
Atlas Powder Co., Wilmington, Delaware.
Joe Barlow, Crowdus & Taylor, Dallas, Texas.
Bay State Belting Co., 349 Congress St., Boston, Mass.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
British Empire Steel Corp., Ltd., Montreal, Que.
Central Chemical Co., Chicago, Ill.
Chemical Products, Ltd., Trenton, Ont.

Fred G. Clark Co., Cleveland, O.
Consolidated Mining & Smelting Co., Trail, B. C.
John Cowan Chemical Co., Ltd., Montreal, Que.
E. I. du Pont de Nemours & Co., Inc., Philadelphia, Pa.
Federal Chemical Co., Louisville, Ky.
General Chemical Co., New York, N. Y.
Globe Chemical Co., St. Bernard, Cincinnati, Ohio.
Grasselli Chemical Co., St. Louis, Mo.
Greene Borthers, Wichita Falls, Texas.
Illinois Zinc Co., Peru, Ill.
Mallinckrodt Chemical Co., St.Louis, Mo.
Mineral Paint Zinc Co., St. Louis, Mo.
National Zinc Co., Kansas City, Mo.
New Jersey Zinc Co., 1111 Marquette Bldg., Chicago, Ill.
Nochols Chemical Co., Ltd., Montreal, P. Q.
Ozard Chemical Co., Tulsa, Okla.
The Refinery Supply Co., Fourth & Detroit Sts., Tulsa, Okla.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Southern Acid & Sulphur Co., Port Arthur, Texas.
Southern Acid & Sulphur Co., St. Louis, Mo.
Southern Agricultural Chemical Co., Atlanta, Ga.
Stauffer Chemical Co., San Francisco, Cal.
Tennessee Copper & Chemical Corp., Lockland, Ohio.
The Texas Chemical Co., Scanlan Bldg., Houston, Texas.
United Chemical & Organic Products Co., New Orleans, La.
Victor Chemical Works, Chicago, Ill.
Victor Chemical Co., Ltd., Victoria, B. C.
Virginia-Carolina Chemical Co., Richmond, Va.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

TAR PRODUCTS, Coal
American Paint & Supply Co., P. O. Box 506, Dallas, Texas.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.
Ward Chemical Co., 226 Atco Bldg., Tulsa, Okla.

TAR, Kiln
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.

TAR, Pine
American Tar & Turpentine Co., New Orleans, Orleans, La.
American Turpentine Co., New Orleans, La.
Atlantic Turpentine & Pine Tar Co., Savannah, Ga.
Braun-Knocht Heimann Co., 576 Mission St., San Francisco, Cal.
Columbia Naval Stores Co., New York, N. Y.
E. Fielding & Sons, Keating St., Toronto, Ont.
Fernwood Lumber Co., Fernwood, Miss.
Flyn Harris Bullard Co., Jacksonville, Fla.
General Naval Stores Co., New Orleans, La.
General Naval Stores, New York, N. Y.
Georgia Pine Turpentine Co., New York, N. Y.
Gulf Naval Stores Co., New Orleans, La.
F. W. Jesup & Co., 90-92 Broadway, New York, N. Y.
Morten, Hoyt & Milne, Inc., San Francisco, Cal.
Pensacola Tar & Turpentine Co., Gulf Point, Fla.
Southern Pine Extracts Co., Pensacola, Fla.
Union Chemical Co., Boston, Mass.
Wade & Bell, Trenton, Fla.

TAR, Retort
Carlton, A. S., 27 Haymarket Sq., Boston, Mass.

TAR PRODUCTS, Coal
Sherwin-Williams Co., Houston, Texas.

Shell Completes 95-Mile Gasoline Line

Ventura, Calif.—After working on the project for more than four months, the Shell Company of California has completed its 95-mile gasoline pipeline from Ventura Avenue field to terminals at Wilmington, California.

The company's gasoline production in Ventura field is now being carried direct to Wilmington, point of export, through the line.

Move Absorption Plant

The Texas Company has moved its charcoal absorption plant from Bald Hill to Winona, Oklahoma, and has put the equipment in operation at this latter place. The rated capacity of the plant is 2000 gallons but it is at present recovering 4000 gallons daily from the natural gas.

Install More Absorbers

The Standard Gasoline Company is installing nine additional absorbers of the Campbell Oil Froth type in two of its Ventura Avenue plants. These improvements will add materially to the efficiency and capacity of the Standard plants.

Shell Doubling Gasoline Plant at Brea

Los Angeles.—Shell Company of California is engaged in enlarging its Brea Canyon gasoline plant. This plant is of the compression type and is being doubled in capacity by the installation of six new compressors. The Brea Canyon natural gas is listed as among the richer gases of the State, as there is about two and one half gallons of gasoline per 1000 cubic feet.

Six new tube stills have been added to the Augusta, Kansas, and Casper, Wyoming, refining plants of the White Eagle Oil & Refining Company.

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A 200-lb. trap won't do any more or better work than a 10-lb. Sarco. So why pay about $110.00 for 190 lbs. additional iron in the heavier trap when you could buy that much iron for $19.00?

Of course, you get about thirty-five additional parts in the big trap not found in a

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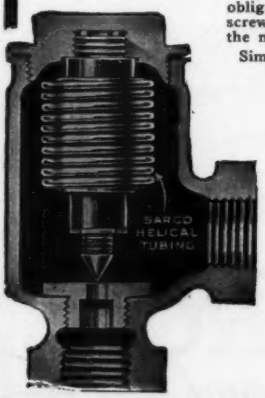
But a greater number of parts means more parts to get out of order and to carry in stock. The No. 9 Sarco Steam Trap is of the self-adjusting, balanced-pressure type. Is suitable for any steam pressure from 0 to 100 lbs.



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Measurements of Gas From the Well To the Gasoline Plant

By D. A. SILLERS,
Superintendent of Measurements, Lone Star Gas Company

THIS subject should naturally begin with the field meter stations. Here we have a choice of flange or pipe connections. In my opinion the flange connections are the most practical, as they are already tapped, and a correct installation is assured. In making pipe connections there is too much chance of variation in the connection itself that might lead to errors. Extensions of a threaded nipple or bubbles of welding metal or burrs from cutting the pipe at the point of the connection may very well cause a pitot tube effect which may lead to an error in either direction. The flange connections also record the maximum differential produced and less loss of vacuum results.

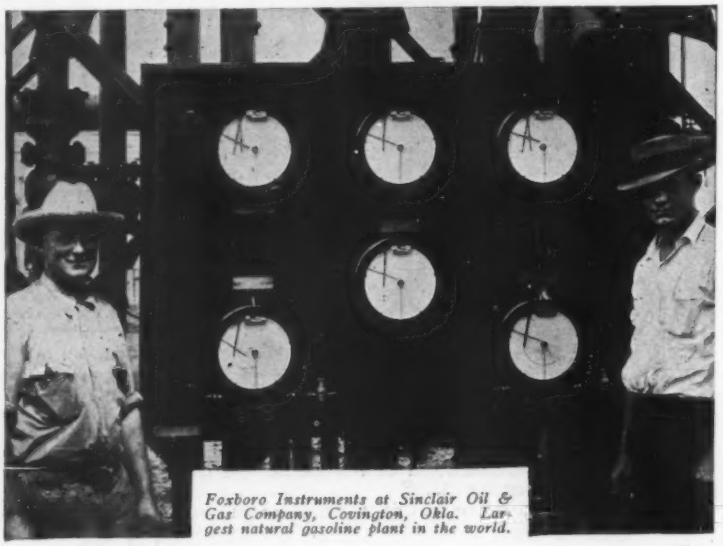
There are many installations with too short a length of pipe before and after the flange. Tests have shown that one elbow on the inlet of a meter does not materially affect the accuracy, but that two elbows introduce swirls which result in measurement that is low. I would recommend as long length of pipe as is practical on the inlet to the flange, but not less than 20 diameters, or if straightening vanes are used, not less than 10 diameters. On the outlet I would recommend 10 diameters for flange connections and 16 diameters for pipe connections.

Leakage in the meter piping is not generally considered a great source of error, but in using a wide range meter, it was noticed that the 20-inch and 100-inch gauges often showed different readings. In practically every case we have been able to eliminate this by eliminating the leaks from our meter piping, and I believe that this piping should be carefully gone over and tested for leaks.

Meter Reading

The orifice meters with the 20-inch range are now very generally used for low pressure and vacuum work. However, there are a number of companies that still use 100-inch meters for this service. Where the static pressure is very low—by this I mean a vacuum—the differential drop may very easily be more than 50 per cent of the inlet absolute pressure. This means that the gas has reached its critical velocity and that a greater differential does not result in a greater flow. The result is an erroneously high differential, which indicates more gas than is actually passing. On page 132 of "Measurement of Gas and Liquids" by Henry P. Westcott, a very good discussion of this problem is given. In this discussion, it is recommended that the reading on the differential gauge in inches of water should seldom exceed twice the value of the static pressure in pounds per square inch absolute.

Most companies have meter men who are familiar with the care and repair of the meter itself. However, some companies consider that they are getting good measurement when they get charts from a meter showing a



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very smooth differential line. This is very often due to a meter with a tight bearing or stuffing box, and is indicative of very poor measurement. Where wells flow by heads, an eradic or "sunflower" chart is to be expected, as the meter can only record the way in which the gas passes through the line. Where this pulsation is caused by liquid in the lines, it can be eliminated by placing drips at low places in the lines. Placing a drip just before the orifice meter does not eliminate this trouble. In my experience, putting dampering devices to restrict the flow of the mercury in the meter gives a sluggish meter that is hard to zero, and in general results in an inaccurate meter.

Most gasoline plants have a master meter which is checked against the total of the well meters. Consideration must always be given to the fact that all leakage in vacuum lines results in air mixed with the gas, which will make the plant meter read high. There may easily be 10 per cent air in the gas as it reaches the palnt and this should be taken into consideration when checking against the field meters.

The plant meter being located quite close to the suction of the compressors is also affected by pulsation which may make the meter read considerably high or low. Pulsation has proved one of the most baffling problems to gas measurement. Lone Star Gas Company has done a great deal of experimental work along this line, and we hope to have some solution for this problem in the near future. The best we have been able to do so far has been to put an orifice plate, the same size as that used in the meter, as close as possible to the compressors. This partially eliminates the error, but the resulting drop in pressure makes it impractical in connection with measuring gas under vacuum. Our tests have shown that putting restrictions in the meter piping is of no value and that putting reservoirs in the meter piping increases the error. When further results are obtained, they will be made known to the industry.

Correct Gravity

A very considerable source of error in measuring gas is due to using wrong or inaccurate coefficients. We stamp all our orifice plates with a serial number, the last three numbers of which show the size of the plate. When an orifice plate is changed, a notice card is sent to the office, showing the number of the plate removed and that of the new plate. A new chart is put on the meter at the time the plate is changed, and a notation of the plate change is also made on the chart. In this way we guard against using a coefficient for a two-inch plate

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when there is a one-inch plate actually in the line. One of the most important factors in getting correct measurement is using the right specific gravity correction factor. Roughly, an error of one point in the second place in the gravity used results in about one per cent error in measurement. The gravity balance is now rapidly displacing the bottle for testing gravities. The gravity bottle is very erratic and almost always gives a low gravity resulting in a high correcting factor, which means that you are paying for more gas than you are getting. Gravity balances can now be purchased which are designed to give accurate results when used by an operator of average ability.

Errors Common

Again in checking the plant meter against the field meters, there is a real problem in arriving at the proper gravity to use for the plant meter. We have recording gravitometer charts from various plants in West Texas showing variations of ten or more points in the second place during a single day. Probably the most practical method of arriving at a gravity correcting factor for the plant meter is to multiply the production of each well by the gravity correcting factor for each well, add all these results, and divide by the total production, the result being the correcting factor to apply in the plant meter.

In computing the charts we find both the plantimeter and the hourly method used. The error due to using the plantimeter is very well discussed in the "Foxboro Hand Book," by Brown and Hall, on page 64. Using the plantimeter will result in an error in measurement from nothing to 15 per cent high. The roughest hourly reading method will be more accurate than this. It is cheaper to read charts by the hourly method than to pay five or 10 per cent too much for the gas purchased. Most extension books give extensions with three significant figures beyond the decimal point. Carrying more than one significant figure beyond the decimal point does not increase the accuracy whatever and greatly adds to the labor in the office.

The Lone Star Gas Company uses a large envelope for filing their charts. On the face of this envelope is the name of the well, location, meter number, and all such information is given, and columns are provided for the date, size of orifice plate, coefficient, daily extension and daily deliveries. At the end of the month we multiply the total of the daily extensions by the coefficient, which forms a check against the total of the daily deliveries, showing any error in multiplication during the month. This envelope is used in place of copying the figures in a ledger and makes a very convenient method of handling the charts.

I believe that a very important factor in correctly measuring gas is that of having some one in charge of the computation of charts who has had experience and fully understands the operation of the meters in the field. When charts are sent into the office and computed in the accounting department or by someone who has not had any experience in the field, a multitude of errors will slip by unnoticed that would be caught by a man with field experience. The computation of the charts and the care of the meters in the field should be under one organization for the best results. If this cannot be done, the man figuring charts or in charge of the figuring of the charts should make periodic visits to the field with the meter man so that he will be familiar with conditions and be able to intelligently handle the charts as they come into the office.

Louisiana Installation

A new charcoal absorption plant has recently been placed in operation by the Owl Oil Company near Greenwood, Louisiana. Residue gas from the company's gasoline plant is being utilized in the manufacture of carbon black. The gasoline plant is one of the new shop-built charcoal plants sold by the Gasoline Recovery Corporation and incorporates many features of the portable plant marketed by this company.

Satisfaction

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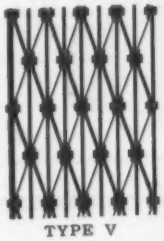

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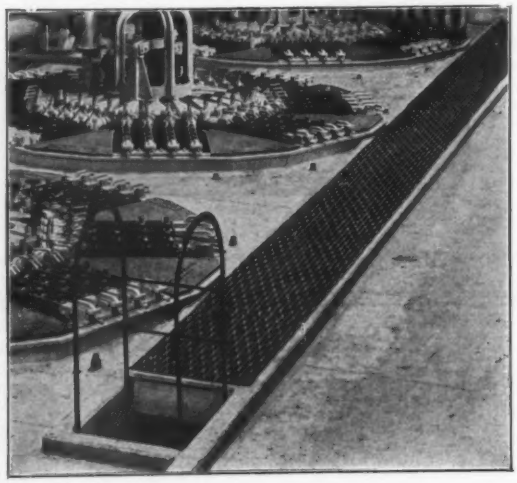

The above paragraphs from a recently received letter — tell the whole story. The only point we might add is that Kerlow Grating Flooring is reversible. There is no wrong side to a Kerlow floor. This fact is unusual but so are all Kerlow products for modern refinery service. Why not write us about our engineering service.

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Safety in the Manufacturing Division

By E. D. MURPHY*
Safety Engineer, Mid-Continent Petroleum Corporation

THE subject assigned to my paper is broad enough that I can handle it in most any way. I do not intend to burden you with many details of safety work in the manufacturing division because most of you are well acquainted with them. I feel inclined to discuss some of the general ideas which we have applied to the accident prevention program in our refinery for several years and for the past few months in the field.

If I were making a measure for a safety man, I would say that his value to his company can be gauged not only by his individual efforts and feeling of responsibility for the safety of the men in the company, but rather by the efforts he succeeds in getting others to make and the feeling of responsibility which he awakens on the part of foremen and the workmen themselves. When men in supervisory capacity feel and exercise a real responsibility for the safety as well as production, and imbue their men with the same idea, the company is on the road to realizing full value from its safety work.

I believe that we will make the best progress in safety only after it is made an integral part of every job or operation, of every foreman's duty rather than letting it remain a side issue or department. The safety engineer should go to the foremen with the attitude of wishing to be of assistance with his problems of handling men rather than going to him as an outside expert who has a lot of new theories that he wishes to try out. Then he will get some real cooperation. Without close contact with and real knowledge of the foreman's gang and his work, we will make many mistakes in safety ideas and plans which may look fine on paper. I believe we will avoid many of these errors by taking foremen and men into our confidence and getting the viewpoints and experience of others on any new features of safety work contemplated.

No doubt, some of you have come in contact with the attitude that because a safety man has not had experience in a certain trade or class of work, he is not fitted for giving advice on how to prevent accidents in that department. I believe this point is often well-taken and we, as safety men, must make our practical knowledge and experience through careful observation of work methods and perhaps, occasionally, taking hold and doing some of the work ourselves.

A Good Start

When starting safety work in a refinery, I believe good results can be obtained from using the plant safety committee idea, in holding safety meetings at regular times. The safety committee idea is also helpful in the smaller industries which do not have full-time safety men. For several years our company used the safety committee idea, but as we progressed with the work and made safety more and more an integral part of every operation, we gradually discarded it. After operating these committees for some time, the natural inclination is to "let George do it"—in other words the committee members. Then the idea of holding "meetings" tends to delay a consideration of such matters instead of taking immediate action. By a system of every-day contact with foremen and

*Read by J. H. Savage before Midwest Congress of the National Safety Council, Kansas City, April 14, 1927.

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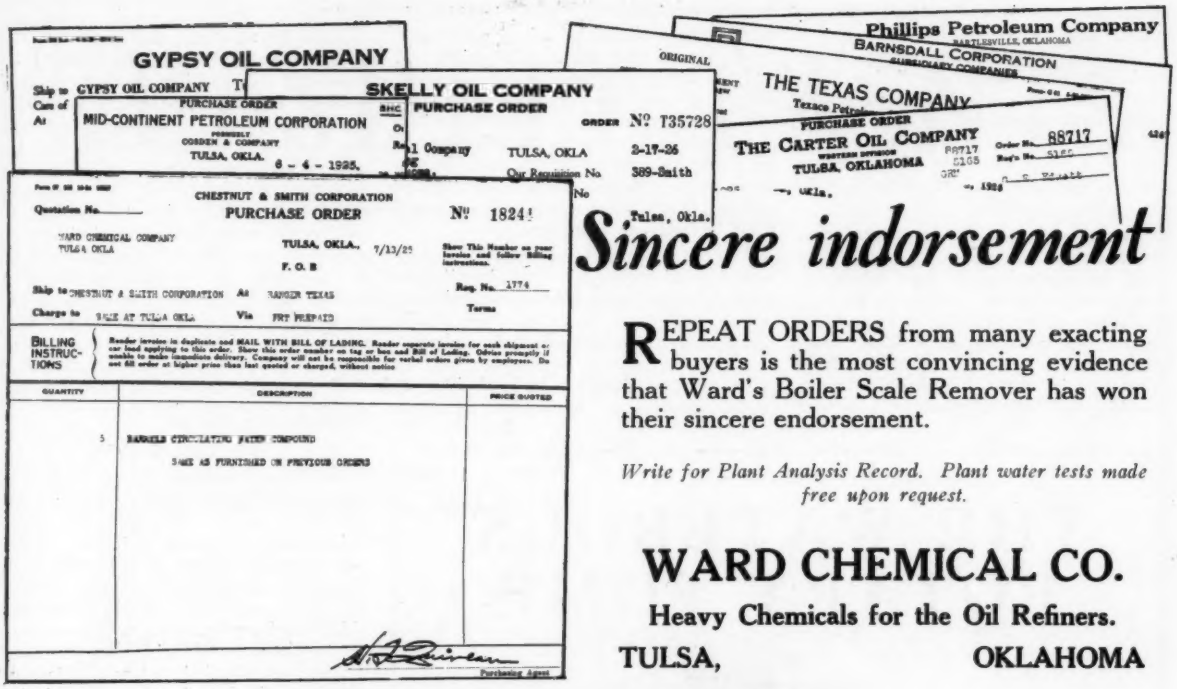

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men, wherever that is possible, we get quicker and better results.

About the only safety meetings we hold are our "department" meetings which are held when necessary. In these meetings we go over the accident experience of that particular department and make our best efforts to renew the pep and interest of the men in preventing accidents.

One of our most difficult problems has been to get the men to practice good housekeeping in their work, to keep small material and scrap properly cleaned up on the job, to keep from obstructing walk-ways, to keep them from leaving loose material and tools overhead; in order to keep down our tripping and falls accidents. I do not believe we have been alone in this difficulty, because other safety men have told me of the same difficulties. It takes a long-time, continuous campaign to get all the men to give their best efforts along this line, and even when the foremen become as much interested in doing this as the safety men, it will be necessary to give daily inspection of various parts of the plant to maintain that interest and efficiency.

We take special pains to prevent possibilities of explosions in light oil containers while same are being welded or when any work is being done inside them which might cause an explosion or where heat may be used. For instance, if a scaffold is to be built in a light oil agitator or treater, or when lead burning, welding work, or hot riveting is to be done, the light oil container is properly washed, cleaned, or steamed; after which an inspection is made to see that vapors have been dissipated, also that oil and chemical lines for charging the container are blinded off. This inspection is made by the foreman in charge of the operating department. After his inspection the safety inspector makes a similar one, and a report sheet is signed by both the foreman and the safety inspector before men are allowed to perform any work inside. This inspection not only applies to agitators and treaters, referred to, but also to fractionating towers, tanks, tank cars, and any other light oil containers.

New Type Goggles

We have recently been conducting some experiments with goggles. We all know about the difficulties that boilermakers and others have, in wearing goggles in hot places during the summer. Glasses get sweaty and fog up. This makes the goggle uncomfortable and inconvenient. We have been trying out a goggle with very fine mesh screen instead of the glass. This gives good ventilation, in the case of rivet heaters, cuts down the glare, and so far, with the use of a limited number of these goggles we have had no cases of fine particles getting into eyes through the very fine mesh wire screen. These goggles were made for us on our special order to one of the standard goggle companies. Our experiments have progressed satisfactorily enough that we are ordering a number of them for regular use in several mechanical departments.

We make continuous use of our safety bulletin boards and frequent changes of bulletins from the National Safety Council, and a number of our own make. We also use the bulletin board for posting a monthly safety news letter, containing items of interest about the accidents which happen from time to time, keeping the employes in touch with the lessons from these accidents and any new safety ideas and suggestions.

The Wrong Slant

When the safety man is making his tours through the yard he has many opportunities to talk with the men on the job about the hazards of the work. In these talks we pick up many new ideas in doing work and of some mechanical defects with which the workman has come in contact. The timid talker often has a helpful idea that he will give in conversation but which would be withheld in a formal safety meeting.

Sometimes men get the wrong conception of why the company does safety work. They may think that the company is interested only from the dollars and cents standpoint. Such

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Proper Design and Operation of Heat Exchangers

By E. F. KALLAM, M. E. *and* A. F. SEMINO

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men must be carefully led to see that well organized safety is not only an economic problem, but it is also a humanitarian one.

The right kind of a safety program will naturally result in making the management more interested in employes and the employes more interested in each other and in the problems of management. Properly analyzed, safety is the expression of fellowship and will result in improved industrial relations and employe morale, bringing out the best in all employes in the way of good will, loyalty and pride in a job done well and safely. Its field of good will also extends to making a better feeling on the part of the public toward the company which is using safety measures.

Everyone having a working knowledge of safety knows that while the engineering phase such as providing guards and proper hand rails, etc., are important in accident prevention, they will eliminate only a comparatively small percentage of the usual run of accidents. In order to get the bigger results we have to turn to the human element. The greater number of accidents is due to persons rather than to machinery. If it were not for people, and the work they have to do we would not have any accidents. Accidents usually come from unsatisfactory planning, and as accident preventionists we must work with others in changing this to satisfactory planning.

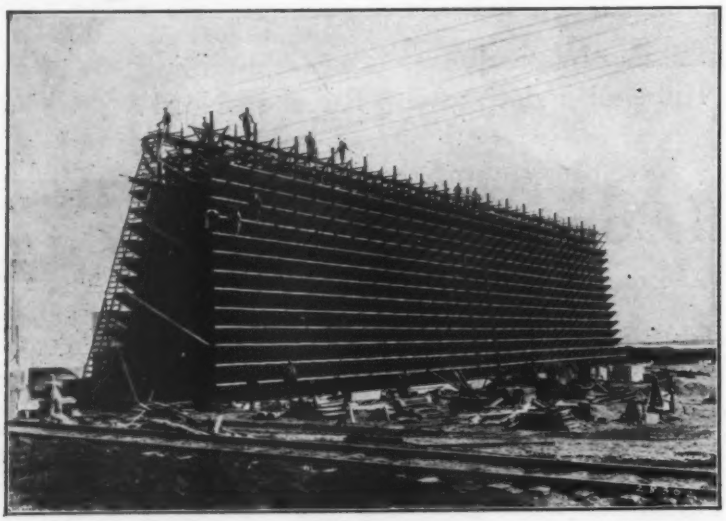
Think First

Human beings generally react to unusual or poorly planned conditions before their intelligence has a chance to work. This might be illustrated by an actual incident which recently occurred in the oil fields. A roustabout working on a lease was passing a drilling well when he noticed blue steam coming from a battery of two boilers. He realized that this was due to low water and rushed to the boilers and turned out the gas fires. Then he went into the fireman's shack and found the man in charge of the boiler asleep. Waking him, he asked what in h—— he was doing, and pointed to the blue steam. The first act of the fireman was to run out to the boilers and start to open the injectors. The roustabout had to forcibly pull the man away from the injectors to keep him from putting cold water into the overheated boilers. This man knew better than to run cold water into the boilers if he had stopped to think first. The aim of the accident prevention work is to try to get persons to plan and do their work with Safety in mind—to think first and react secondly. Safety work, then, is largely the education of employes in safe thinking and safe ways of doing work and establishing certain rules for operation.

There are only a few refineries in this part of the country which do not require a physical examination of employes to insure healthy, normal personnel, which is the first requisite for safety. The next item of importance, I believe, is that the men be given a comprehensive talk on their new work; the policies of the company which is hiring him; the hazards that he may meet and how they may be anticipated. In this talk he would be fully impressed with his duties to perform work safely at all times; to cause a delay rather than take a chance of causing an accident; that it is his duty to immediately report any hazards.

It is a comparatively easy matter to arrange for repairing of unsafe tools or equipment in refineries; therefore to insure real safety, we think it should be the rule that men shall never use any tools or equipment in a dangerous condition.

I believe we should be slow in putting out rules or safety regulations—but once found necessary should be enforced. If advisable to put out a list of operations where goggles are required we should work to get foremen to exercise their responsibility in seeing that the men do not violate them. I mention the goggle proposition because that is a common one and about which there is considerable "deploring." I have heard a number of safety men and foremen say "Yes, we furnish goggles, but it is very hard to get the men



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to wear them." In promulgating safety rules, have them based on common sense and good practice, but once agreed upon by not only the safety man, but those in charge of the operations, should be enforced and thereby given proper weight of respect.

Stripping Plant Starts

The Cienga Corporation recently placed in operation its high pressure stripping plant at Huntington Beach, California. The plant was manufactured and constructed by J. A. Campbell of Long Beach, California. The plant will re-run gas from the line of the Southern Counties Gas Company, operating under 250 pounds pressure and with a daily capacity of 10,000 gallons.

Cracking Seminole Crude

At the Joplin, Missouri, refinery of the Wilhoit Refining Company, crude oil is now being charged direct to the cracking unit. About 600 barrels of Seminole crude is charged to the unit daily—the Jenkins units having a capacity of 1000 barrels when operating on gas oil. The operating pressure is reported at 100 pounds per square inch, and a substantial amount of gasoline is cracked from the crude. Gas oil suitable for charging stock is also produced. Twenty days of each month the company will charge crude to the unit, and during the other ten days the plant will operate on gas oil charging stock. The skimming plant is at present shut down.

C. M. Alexander has recently been appointed general superintendent of refineries for the Imperial Refining Company, operating the Imperial plant at Ardmore, Oklahoma, and the Kettle Creek Refining Company, with its plant at El Dorado, Arkansas. The two companies are owned by the W. B. Hasset interests. Mr. Alexander has been doing consulting work in the Mid-Continent and Gulf Coast for the past several years and formerly served the company with which he is now connected in a consulting capacity for several months while improvements and additions were under way.

Gasoline Plant Building at Isom, Texas

Amarillo, Texas.—The Federal Gasoline Company is well under way with the construction of its first natural gasoline plant. This installation is going in at Isom, Texas, and will be a permanent type, 10,000 to 12,000 gallons daily capacity. Natural gas is to be supplied by the Pantex Oil Company from its properties, to the Federal Gasoline Company. Both these companies are part of the Dorset Carter interests.

Operating at New Site

Operation of Roxana Petroleum Corporation's three-unit portable combination natural gasoline plant in the Fluhman field, North Central Texas, was started during the latter part of April. The plant was moved to the Texas site from the Braman field in Oklahoma.

Enlarge Cyril Refinery

Anderson-Prichard Oil Corporation, Oklahoma City, are enlarging the skimming plant located at Cyril, Oklahoma, from 1500 to 2000 barrels capacity, by the installation of additional stills. A new agitator is included in the new equipment.

Paragon Improves Plant

Improvements at the Paragon Refining Company's Toledo, Ohio, plant include the recent enlargement of its skimming capacity to 10,000 barrels. The two Dubbs cracking units, with a rated capacity of 3000 barrels daily, and the first cracking units installed by this company, were recently put in operation.

The General Petroleum Corporation has recently installed a Campbell Oil Froth absorber and a Campbell stripper in its Sterling plant at Long Beach, California, which it purchased during the summer of 1926. At Ventura Avenue the same company has recently placed in operation a 20,000 gallons Campbell absorption plant.

EXTRACTS OF REFINING TECHNOLOGY

Solvents for separating Aromatic and Aliphatic Hydrocarbons in Oils—After a survey of the solvents which have been previously used for this purpose, the author discusses several new solvents that he investigated, and this includes four which gives satisfactory results. Laevulic acid, which can be used at the ordinary temperature, and is readily recovered by extraction with water,gives theoretical results for the aromatic content of oils which contain up to 90 per cent of these constituents In extracting light oils or oils of medium viscosity the proportion of solvent to oil is three and one half to one, but with highly viscous oils or mixtures containing turpentine oils a proportion of two to one gives more reliable rerults.

Phenylhydrazin is suitable for extracting many oils, the proportions varying with the nature of the oil, but it is not suitable in the case of hydrocarbons of low boiling point. Glycol monoacetate in the proportion of three to one gives reliable results at the ordinary temperature for light oils and oils or medium viscosity, and of two to one for highly viscous oils, except where the aromatic content is high, when the mixture must be cooled with ice. In such cases laevulic acid is to be preferred. Furfuraldehyde used in the proportion of one to one is a reliable solvent for extracting all oils. It must, however, always be used at a temperature of minus ten degrees C. Petroleum Zeitschrift, 1927, volume 23, pages 73 to 77.

* * *

Oxidation of Lubricating Oil—The property of oiliness does not come into action in machinery in which bearing surfaces are of adequate dimensions and bearing pressures moderate. Most failures in lubrication are occasioned by oxidation changes in the oil interfering with its regular supply to bearings. Oxidation leads to the formation of viscous or solid substances, and of jelly-like emulsions with water, and the necessity for an oxidation-resisting lubricant is marked in cases where the oil is returned to a sump and again fed into the machine.

Experiments were made on eight oils of approximately similar viscosity, with various bases. The hard asphaltum content and viscosity and coke value before and after blowing were taken as an indication of the liability to oxidize. The samples were found to vary considerably in this respect. Journal Institute Petroleum Technology, 1926, volume 12, pages 582-5.

* * *

Utilization of Light Petroleum and Petroleum Residues—The light petroleum fraction, which has a boiling point between 10 and 70 degrees C and which consists mainly of pentane and hexane, is suitable for use as a selective solvent and precipitant for many compounds, and as a source or derivitaves of the lower paraffins. Thus the hydrocarbons can be used, by intermediate conversion into their monochloroderivitaves and suitable fractionation, for the production of amyl alcohols, for example, or of technical amyl acetate. The residues of boiling points in excess of 300 degrees C, which are obtained from petroleum oils with a high naphthene content, for example Russian mazut, yield on pyrogenic decomposition at 700 to 800 degrees C considerable quantities of isoprene, benzene and toluene. Chemiker Zeitung, 1927, volume 51, page 4.

John H. Loomis, chemist in the employ of the Richfield Oil Company, of Los Angeles, at its Hynes (Rioco) refinery, has perfected and is patenting a process for eliminating all objectionable refinery odors. The first plant of this type is now in operation at the Hynes refinery and its operation has been satisfactory in every respect.

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Enlarge Empire Refinery At Ponca City

Various improvements and additions at the Ponca City refinery of the Empire Refining Company, are progressing nicely. Construction of the large compound house has started. In this department the company will make a complete line of lubricating oils and an entire line for the industrial smokestack type paints, and a full line of greases. Construction work is also under way for the new tubular retort for No. 2 battery. It is planned to motorize the entire plant for pumping, etc., with electrical power. Some new equipment will be installed in the boiler house to provide additional steam for various purposes about the plant. Work on the four new Dubbs cracking units being installed is getting well under way. Superintendent R. R. Mills at the Ponca City plant states that the program of additions and improvement should be completed by August 1, this year.

Enlarge Empire Plant

Tulsa. — The Tallant, Oklahoma, plant of the Empire Gas & Fuel Company is being enlarged in capacity from four units to five. The new unit under construction consists of a 1000 h.p. double action twin tandem Cooper unit. It is expected that the new unit will be in operation sometime late in June. The main building is being enlarged and additional equipment such as after cooling system, etc., is being installed.

Refinery Changes Hands

The 2000 barrel skimming plant of the Sweetwater Refining Company at Sweetwater, Texas, has been purchased by A. R. Stribling and J. R. Travis and associates, of Duncan, Oklahoma. The plant has been shut down for a long time. Equipment will be reconditioned and the plant made ready to run when market conditions justify its operation either at Sweetwater or some new location.

Pan-American Petroleum & Transport Company has its gasoline plant in operation at Alamitos Heights, the northwest extension of the Signal Hill field, Long Beach, and is extracting four gallons of gasoline per thousand cubic feet from gas derived from its Naples No. 1 in the new field.

Phillips Petroleum Company will begin the immediate construction of a 6000 gallons capacity gasoline extraction plant in the Noodle Creek field, Texas.

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Western Refiners Name Committees

Tulsa.—Committees of the Western Petroleum Refiners Association have been selected for the year as follows:

Legal Committee: W. A. P. German, Skelly Oil Company, chairman; J. C. Denton, Mid-Continent Petroleum Corporation; W. C. Franklin, Tidal Refining Company.

Technical Committee: C. L. Henderson, Vickers Petroleum Company, chairman; F. B. Koontz, Mid-Continent Petroleum Corporation; H. W. Camp, Empire Refineries, Inc.; Walter Miller, Marland Refining Company; Dr. F. W. L. Tydeman, Roxana Petroleum Corporation; W. E. Moody, Shaffer Oil & Refining Company; F. E. Holsten, Barnsdall Refineries, Inc.; L. F. Bayer, Tidal Refining Company; W. F. Sims, Panhandle Refining Company; J. A. Sartori, Producers & Refiners Corporation; J. W. Wardsworth, Independent Oil & Gas Company; Dr. E. R. Lederer, Texas Pacific Coal & Oil Company; C. R. McKay, Pierce Petroleum Corporation; R. J. Black, Sinclair Refining Company; A. J. Slagter, Trnascontinental Oil Company; Dr. C. K. Francis, Skelly Oil Company.

Traffic Committee: F. A. Pielsticker, Skelly Oil Company; H. W. Roe, Mid-Continent Petroleum Corporation; A. C. Holmes, Empire Refineries, Inc.; H. C. Mulroy, Marland Refining Company; W. M. Powers, Lubrite Refining Company; A. F. Winn, Skelly Oil Company; R. J. Burchett, Shaffer Oil & Refining Company; L. B. Lea, Pierce Petroleum Company; J. M. O'Day, Sinclair Refining Company; Henry Hausman, Pure Oil Company; E. W. Seiboldt, Roxana Petroleum Corporation.

Finance Committee: Roy B. Jones, Panhandle Refining Company, chairman; George D. Locke, Barnsdall Refineries, Inc.; C. L. Henderson, Vickers Petroleum Company.

Membership Committee: L. R. Crawford, Producers & Refiners Corporation, chairman; E. W. Goebel, Manhattan Oil Company; J. L. Gray, Shaffer Oil & Refining Company; E. H. Eddleman, Continental Oil Company of Texas; A. E. Landsittle, Globe Oil & Refining Company; Walter K. Campbell, Western Oil Corporation.

Credit Committee: R. R. Irwin, White Eagle Oil & Refining Company, chairman; Emery Burnett, Continental Oil Company; H. G. McLean, Empire Refineries, Inc.; W. Z. Brown, Producers & Refiners Corporation; M. D. Creel, Marland Refining Company; G. A. Burns, Roxana Petroleum Corporation; J. M. Judson, Sinclair Refining Company; Fred Barman, Pure Oil Company; H. W. Bottomfield, Transcontinetal Oil Company; F. T. Hopp, Skelly Oil Company; H. M. Edinger, Barnsdall Refineries, Inc.; Charles Klein, Mid-Continent Petroleum Corporation; M. A. Chambers, Panhandle Refining Company; A. J. Ablum, Crystal Oil Refining Company.

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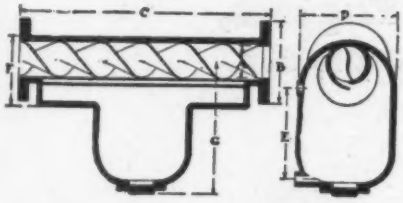

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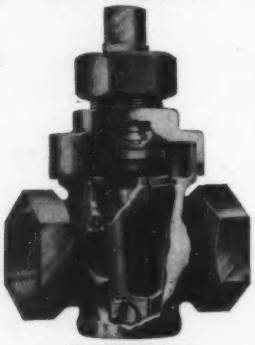

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Continental Improving Oil City Plant

Oil City, Pa.—The $200,000 improvement program of the Continental Refining Company here has recently been completed. The Continental is operating one of the oldest refining installations in the United States, this plant having been in operation since the year 1885. The most important improving equipment installed by the company recently is the 1000-barrel Foster pipe still or tube heater, which will be utilized in the manufacture of cylinder stocks. This installation marks the first of its kind, being the first tubular retort ever installed for the preparation of cylinder stocks from Pennsylvania crude oil. A tail gas, or vapor recevery system has also been installed. In conjunction with the pipe still all of the conjunctive equipment consisting of late designs of scientific fractionating columns, condensing and heat exchange, has also been installed.

I. N. Abrams Company is erecting a 10,000 gallon daily capacity absorption gasoline extraction plant in the Alamitos Heights field, at Long Beach, California.

Completing New Plants In California

Los Angeles. — Construction of an absorption plant being built by J. A. Campbell of Long Beach, California, is well under way at Saticoy, Ventura County, California, for the Ventura Fuel Company. It is to cost $150,000. The natural gas, carried over the hills from the Ventura Avenue field, will run through the plant and the dry gas will be transported through a 16-inch line to consumers along the route and on to Los Angeles.

The Campbell company recently completed an absorption plant for the General Petroleum Corporation which replaces the one destroyed by an explosion early this year.

Fry Pool Gasoline Plant

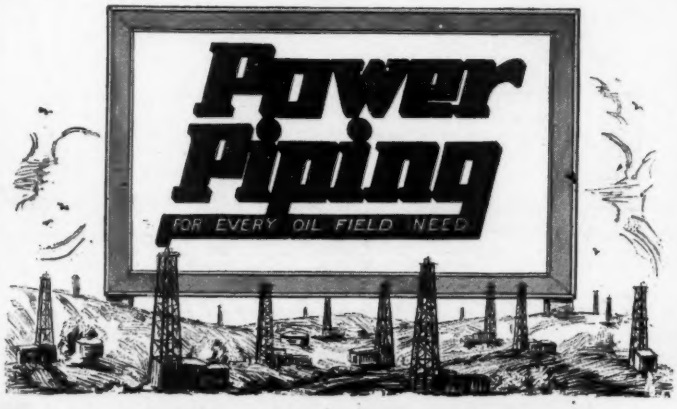
Natural gasoline plants of the Amerada Petroleum Corporation in the Fry pool of Brown County, Texas, is being enlarged. The plant is located on the Wentz Oil Corporation's Shore lease, and with eight units in operation has been producing about 20,000 gallons of gasoline. The enlarging work consists of the installation of three additional units which will increase the production to around 30,000 gallons daily. The original plant began operations February 4, but has been operating to capacity only during the last month. Gas in the Fry pool yields about three gallons per thousand cubic feet. The Amerada also has a two-unit plant in operation on its M. E. Fry lease which was originally a portable plant, but is now a permanent installation.

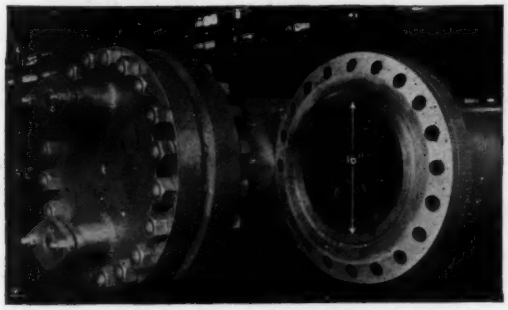
Treat "Dry" Gas

Los Angeles.—The West Coast Refining Company, operating an absorption natural gasoline plant at Placentia, Orange County, California, is installing a Newton plant for the extraction of additional gasoline from the so-called dry residue gas from its present low pressure plant. Compressors are being installed for the purpose of boosting the residue gas to high pressure for charging to the new high pressure retreating installation.

New Compressor Station

Tulsa. — The Empire Gas & Fuel Company is constructing a new natural gas compressor station in the North Winfield district, to be located in the northeast of section 22-32-4, Cowley County, Kansas. The installation will consist of 170 horsepower single acting twin Cooper compressor machines with the necessary auxiliaries. It is expected that this plant will be ready for operating during the latter part of May.





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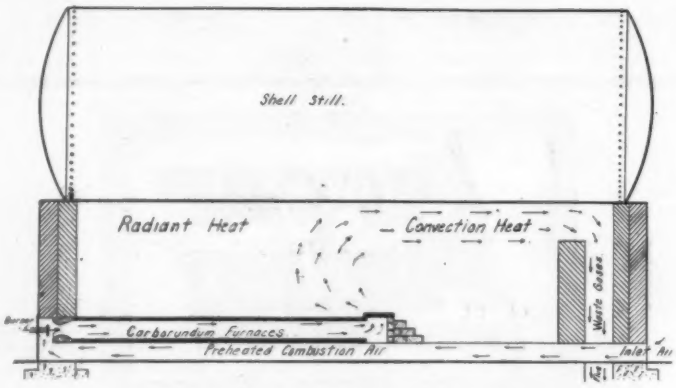

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Mid-Continent Tank Car Building New Shops

Tulsa.—The Mid-Continent Tank Car Company, with tank car repair shops at Coffeyville and Pittsburg, Kansas, is constructing a similar tank car shop at Sand Springs, Oklahoma, just west of Tulsa. The Mid-Continent Company, it is reported, will eventually move its Coffeyville shops to the new building. This is the third tank car repair shop to enter the field at Sand Springs. The General American and the American Car Company are already operating shops near Tulsa at Sand Springs. Mr. C. L. Deckard is manager of the new repair shop.

Julian Corporation Begins Gasoline Manufacture

Los Angeles.—Julian Petroleum Corporation has recently become a manufacturer of natural gasoline through the completion of its Huntington Beach absorption installation. The plant is of the Newton type and has a daily capacity of 8000 gallons daily. Present production is about 5000 gallons, recovered from approximately 3,000,000 cubic feet. The gas handled by this plant is coming from nine of the company's wells, several of which are operating on the gas lift.

Borger Absorption Plant

The new absorption gasoline plant of the firm of Maupin & Burnett, on the Dunnigan lease. southeast of the southwest of section 21, block Y of A. & B. survey in the Borger area of the Panhandle, Hutchinson County, Texas, is now under construction. This plant will be a three unit, Southwestern type 75, with a rated capacity of 36,000 gallons of gasoline daily. Nelson C. Stein and A. Sackin, financiers of Hollywood, California, who were recent visitors in the Panhandle area are associated with Maupin & Burnett in the operation of the gasoline plant.

S. D. Oliphant, sales representative in the Mid-Continent fields for Babcox and Wilcox Tube Company, with headquarters at 85 Liberty St., New York, has recently established sales office for this company's products at 608 Mayo Bldg., Tulsa. Mr. Oliphant was formerly with the A. M. Beyers Pipe Company.

George C. Armstrong, vice-president of the Indian Refining Company in charge of manufacturing, has resigned.

Build Kerosene Treating Plant at Batoum

New York.—Equipment of a kerosene treating plant, to be constructed by the Standard Oil Company of New York, has been received at Batoum, one of the principal oil ports of the Soviet Union on the Black Sea, according to advices received by the Amtorg Trading Corporation. The capacity of the plant will be upwards of 150,000 long tons of kerosene per year.

The plant is to be built in connection with a contract signed in London December 21 last between the Standard Oil Company of New York and the Soviet Oil Syndicate (Naphtha syndicate U. S. S. R.) whereby the Standard will purchase up to 50,000 long tons of kerosene in three years.

The contract provides that the Standard is to build the plant and immediately turn it over to the Soviet Oil Syndicate, with the proviso that the Standard is to operate it under lease for three years, with an option for renewal for another three years.

This is the first contract signed by the syndicate for the construction of a plant by a foreign firm.

The Soviet Union is now exporting about 70 per cent more oil than before the war. Production during the past fiscal year, ending September 30 last, was 8,142,000 metric tons. Production during the first quarter of the current fiscal year was 2,478,000 metric tons, an increase of 30 per cent over the same period last year and eight per cent greater than the quarterly output of 1913.

Operating Second Plant

The second gasoline plant of Roeser & Pendleton, in Shackleford County, was put into operation during the latter part of April. The plant is on the Moberly lease in the Hope pool, six miles west of Albany, Texas. It has a capacity of around 3,000,000 cubic feet of gas daily. Gas production yields about two gallons of gasoline per thousand cubic feet. Equipment consists of three 80-horsepower Clark Brothers compressors, one recompressor and an auxiliary unit. Newton absorption and distillation equipment is installed and Braun cooling system. Four 20,000 gallon storage tanks are installed. The first plant of the same company is known as the Cook Pool plant, consisting of nine units—and producing about 21,000 gallons of gasoline daily.

Ralph Newton, formerly in charge of the research work for the Newton Process Manufacturing Company at Fullerton, California, has become affiliated with the Standard Engineering Company as foreman of plants, succeeding H F. Jamieson, resigned.

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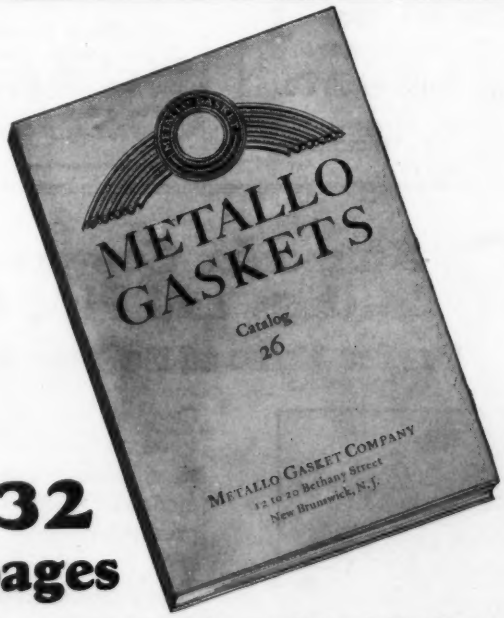

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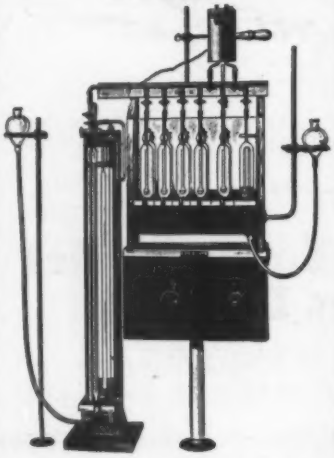

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New Company to Operate Allen, Okla., Plant

Tulsa.—Organization of a new refining company for the Mid-Continent area was announced during the month. The White Oak Refining Company, with offices on the sixth floor of The World Building. The newly organized company, has purchased the refinery at Allen, Oklahoma, from the North American Tank Car Company. The plant was formerly operated by the Mecca Refining Company, but has been shut down for about three years. The plant has a capacity at present of 2500 barrels, but it is proposed to remodel, with the installation of efficient bubble towers, new condensing equipment and efficient heat interchargers, with the view of having the plant ready to resume operations around June 1.

W. M. Welch of Tulsa is president of the company. Mr. Welch was formerly with the Tidal Refining Company, and is the recent organizer of the Beaver Refining Company, Ltd., at Coutts, Alberta. The Beaver Company is now installing a Leamon cracking unit.

J. M. Storey is vice-president of the White Oak Refining Company. The Electric Public Service Company, which recently purchased the natural gasoline plant of the W. M. Welch Company at Bristow, Oklahoma, is a stockholder in the new refining company.

R. L. Walde, formerly superintendent of plant operations for the Inter-Ocean Refining Company at Bristow, Oklahoma, will have charge of plant operations at the reconditioned plant at Allen. It is planned to operate exclusively upon Seminole crude, securing production by contract from the Amerada Petroleum Corporation from this company's leases in the Bowlegs field. The White Oak Company will soon begin laying four-inch pipe line from Allen to the field, about 25 miles, connecting the plant to the source of production.

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Excavation work for the new California Petroleum Corporation Building in Los Angeles was started during March. The site is on Broadway between Ninth and Tenth Streets.

The Spanish-Gothic skyscraper was originally designed by C. Howard Crane of the firm Walker & Eisen, architects, for United Artists, Inc., who are planning to occupy the ground floor of the building with the first of a chain of motion picture theatres to be built in leading cities of the country.

After plans had been drawn, and just as construction work was about to start, Jacques Vinmont, president of the California Petroleum Corporation, completed a transaction with Joseph M. Schenk, head of United Artists Theatres, whereby the 12 floors of the new office building above the theatre were leased to California Petroleum for more than $3,000,000 and for a period of 30 years.

California Petroleum plans to spend about $100,000 on their section of the building, which will be completed early in 1928, which will provide for such items as special furnishings, a roof garden, and a large cafe for employes. Total cost of the structure will be around $3,500,000. The crowning feature of the building will be the tower, which will rise 254 feet above the street, decorated by special lighting equipment.

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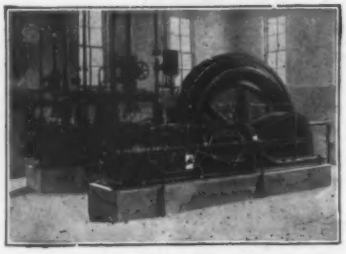

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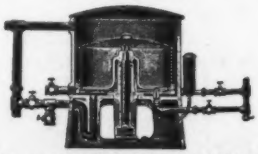

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Somerset Gasoline Plant

P. S. Powell of San Antonio reports closing a deal with the producers of the Somerset field and Oscar J. Berand of Tulsa, whereby Berand will erect a natural gasoline plant of the compression type to extract gasoline from Somerset gas production. Estimated cost of the installation is $500,000 and the daily capacity of the plant will be 7000 gallons. Construction of the plant is now underway. It is located southwest of the town of Somerset. Pipe lines will be run to the wells to gather the gas production from the many small producers, which product has heretofore been little used. O. J. Berand was formerly an executive of the Skelly Oil Company.

Tidal Personnel Changes At Tulsa

Tulsa.—A. F. Garrett, vice-president, has been given charge of the western division of the Tidal Refining Company, Tidal Pipe Line Company, Tidal Western Refining Company and the Tidal Chelsa Refining Company, headquarters in Tulsa. His appointment ment follows the transfer of L. F. Bayer to the Pacific Coast, where he has become vice-president in charge of manufacturing for the Associated Oil Company, with headquarters in San Francisco.

Both the Tidal Refining Company and the Associated Oil Company are subsidiaries of the Tide Water-Associated Oil Company.

Mr. Garrett has been with the Tidal Company for seven years, having been in charge of the sales department. More than a year ago he was made a vice-president of the concern.

Other changes in the Tidal office at Tulsa place C. R. Burton chief engineer, in charge of the manufacturing operations, R. N. Cline, sales manager, and O. S. Ambrose as assistant to Mr. Garrett.

The Union Oil Company is building a new compressor plant on its Morse lease in the Richfield field, Orange County, California, to enable the company to enlarge the scope of its gas lift work in this area. The present plant is considerably overloaded, and the new installation, which will handle approximately 15,000,000 cubic feet of gas per day will make up the additional requirements.

Machinery for the plant is on the ground and all concrete work has been completed. The plant will consist of five Worthington gas engine compressors of the tandem type. Four of these are 320 horsepower, and one is 640 horsepower. This will be the largest Worthington installation in the California oil fields.

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Plibrico Stucco is ideal for still furnaces as well as boilers. The photograph shows the

for stills

application of Stucco to the furnace of a Dubbs cracking unit at a refinery in Oklahoma.

There's a page in the new 36-page catalog that tells about Plibrico Stucco. Ask for the catalog and for additional information on Stucco. "Cutting Furnace Costs" also describes the ordinary application of Plibrico—as a monolithic, one-piece jointless fire wall that outlasts firebrick construction 2 to 4 times.

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